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FORMER CIO Katherine M. Hudson, now CEO of Brady Corp., says a CEO has to be the "consummate generalist."

THE TREND IS UNMISTAKABLE: More and more CIOs are breaking through the IT ceiling to become chief operating officers or even CEOs. But it takes business savvy and leadership skills that many CIOs will never have.

Story by Melissa Solomon begins on page 38.

NEWSPAPER

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IT SECURITY DESTINED FOR THE COURTROOM

Analysts: Victims of cyberattacks likely to seek recompense from any party involved

BY JAIKUMAR VIJAYAN

Companies that don't have consistent and verifiably appropriate security practices for protecting their IT assets are opening themselves up to liability lawsuits, warn security experts.

IT LIABILITY

Although none have been filed yet, such suits would force companies to take responsibility for their roles, however unwitting, in security breaches that involve their computers. These might include distributed denial-of-service attacks, the spread of computer viruses, public disclosure of confidential information or financial loss to business partners and customers.

"You can expect to see major liability lawsuits in the next 18 months" or so, said Randy Marchany, a member of the Virginia Tech Computing Center's systems management group and the coordinator of its Computer Incident Response Team, speaking at the SANS 2001 technical conference in Baltimore last week.

Increasingly, companies that fail to show due diligence in minimizing their exposure to such threats will become tar-

IT Security, page 73

PROBLEMS PLAGUE INVENTORY SYSTEM

Late payments, lost discounts stymie L.A.

BY MARC L. SONGINI

The Los Angeles Police Department would have to write an awful lot of traffic tickets to break even after it got a $750,000 invoice for new citation books that actually cost just $7,500. The culprit: incorrect data entered into a new procurement and inventory-management system that the city government began using in January.

The Police Department isn't the only agency in the City of Angels that's having problems with the $11 million system, which is based on PeopleSoft Inc.'s enterprise resource planning applications. City officials this week confirmed that multiple departments have voiced complaints about inadequate end-user training and help desk support, resulting in billing problems, late payments to suppliers and inventory shortages.

"The [system] was meant to speed things up and save money," said Laura Chick, a city councilor and the incoming city controller. "So far, we are not

Los Angeles, page 16

- The city of Los Angeles is facing inventory stock-outs, billing problems, and inadequate training and help desk support following the rollout of a PeopleSoft procurement system. The two-year, $11 million implementation went live in January.
- City officials are working on a proposal to address these issues. Among the major remedies they are considering is more extensive training.

UCITA FOES SLOW BILL'S PROGRESS

But software licensing battle far from settled

BY PATRICK THIBODEAU

Opponents of the controversial UCITA software licensing law appear to have succeeded in stalling the bill in states where it's being considered this year. The vendor-backed measure has consequently been robbed of the early momentum it gained last year following relatively quick adoptions in Maryland and Virginia.

But both sides in the battle, which pits technology vendors against some of their corporate customers, say they're preparing for years of haggling over the Uniform Computer Informatioo Transactions Act.

"Is the fight over? No," said Gordon Pence, an attorney at Caterpillar Inc., which is opposing passage of UCITA by state legislatures. "We did really well this year, stopping it in all the states where it was introduced. But I don't think the pro-UCITA contingency is going to give up."

UCITA, page 16

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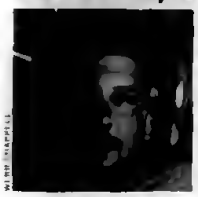
DOUGLAS KIRKLAND

KEEPING PACE WITH TECHNOLOGY

CIOs like Cora Carmody (left) use many methods to keep up with developments in technology and to make sure that their IT staffs have the right mix of skills that can meet current and future business needs. **PAGE 44**

HIGH HOPES, HARSH REALITIES



MARK HAPPEL

Want a fat paycheck? What better industry than financial services, right? IT job candidates seem to think so, according to managers we spoke with, including WorldStreet's John Kivel (left). Problem is, the market has taken a turn for the worse, job candidates are more plentiful, employers are more fussy, and salary offers are less generous than many job seekers are expecting. **PAGE 82**

MAY 21, 2001

COMPUTERWORLD THIS WEEK

NEWS 6

6 IBM middleware products get a Web services upgrade, but even the company says it's still not an e-commerce panacea.

7 Covisint outsources its entire infrastructure to Exodus.

8 Software rivals Vignette and BroadVision both introduce upgrades to their portal products.

10 IBM and Intel set up partnerships with health care vendors to advance wireless technology in patient care.

12 E-mail and Internet access are now available on the Royal Canadian Pacific, a luxury cruise train operating in the Canadian Rockies.

14 The Bush administration begins to sell its new approach to critical infrastructure protection.

BUSINESS 31

34 Wireless supply chains are gaining steam as early pioneers see savings and increased efficiency.

36 Workstyles: A wunderkind gets a taste of the real world as lead developer at Lightflow.

36 Ed Yourdon writes that outsourcing is another element that project managers must master.

38 CIOs are climbing the corporate ladder to the top as IT grows in importance to businesses. But are they ready to be CEOs?

46 IT graduates are entering the workforce en masse, but the number of jobs available is decreasing.

49 Joe Auer offers a list of traditional leasing provisions that must be treated differently when the subject is laptops.

TECHNOLOGY 51

52 An ion gun replaces a velvet-covered rubber roller in IBM's new method of manufacturing LCDs for computers.

54 Security Journal: Security manager Mathias Thurman tests an intrusion-detection system to see if it lives up to its hype.

56 Future Watch: A new ultrasound system developed by AT&T will be able to locate a person wearing a tracking device to within inches, and then create a virtual picture of his environment.

60 Emerging Companies: KVS's Enterprise Vault automates the archiving and retrieval of Microsoft Exchange Server e-mail messages.

58 Smart cards promise to increase security through better authentication, but users say tough integration and management issues remain.

OPINIONS 26

26 **Maryfran Johnson** wonders if we make too big a fuss about CIOs becoming CEOs.

26 **Pimm Fox** says IT doesn't have to spend a lot to help deal with crises such as "mad cow" disease.

27 **John Gantz** urges IT to prepare for a "scramble" to meet corporate demand for mobile access.

32 **Don Tapscott** writes that firms should use the Web to forge deeper relationships with their customers.

32 **William M. Ulrich** explains why you shouldn't write off Cobol from your corporate IT plans.

74 **Frank Hayes** says that if your CIO is one of your company's five best-paid executives, consider yourself fortunate.

Editorial/Letters	26, 27
How to Contact CW	72
Company Index	72
Shark Tank	74

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E-MAIL FLAP

Sometimes, the e-mail list you acquire is more than you bargained for. Find out more in Deborah Radcliff's column.
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HAMMERING OUT HIPAA

Can a phased approach similar to that used by e-businesses be the thing that's needed to bring the Health Insurance Portability and Accountability Act to life? Find out in the *Computerworld* Security Community.
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AT DEADLINE

Tivoli, IBM Prepare for Management Changes

Tivoli Systems Inc. President David Murphy left the IBM subsidiary Friday to join a smaller software company in California. IBM spokesman Joe Stunkard confirmed Murphy's departure, as well as reports that Steven Mills, an IBM senior vice president and group executive, will take over the head job at Austin, Texas-based Tivoli in the interim. Meanwhile, IBM Chairman and CEO Louis V. Gerstner said in a television interview last week that Sam Palmisano, IBM's president and chief operating officer, will take over the technology giant as soon as its board of directors is ready to make the change.

RIM Gains Patent, Sues Competitor

Research in Motion Ltd. (RIM), manufacturer of the compact BlackBerry e-mail pager, has landed a U.S. patent that protects its core Single Mailbox Integration technology. That technology redirects mail from a host computer to mobile devices, letting mobile workers use the same address, regardless of their location or terminal. Waterloo, Ontario-based RIM used the new patent as the basis for an infringement suit against Glenayre Electronics Inc. in Charlotte, N.C.

Short Takes

COMMERCE ONE INC. in Pleasanton, Calif., last week said it will lay off up to 10% of its 3,000-employee workforce. The company had not made the news public in early April when it announced an earnings drop, but a spokeswoman said the layoffs began in the middle of the first quarter. . . . The Wakefield, Mass.-based ASP INDUSTRY CONSORTIUM and the WORLD INTELLECTUAL PROPERTY ORGANIZATION (WIPO) released final guidelines that will be used by Geneva-based WIPO's Arbitration and Mediation Center to resolve disputes between application service providers and their customers on a global basis.

IBM Moves Toward Free Flow of Info

But analysts question whether competitors will support its open B2B standards effort

BY MICHAEL MEEHAN

THE WORDS *open* and *standards* are loaded terms in the world of e-commerce, but IBM last week promised to re-release its middleware products around what it hopes will be open Internet standards that can nudge businesses closer to achieving the free flow of information.

Yet users and analysts questioned whether vendors will ultimately be able to curb their proprietary tendencies to make the open standards IBM has embraced capable of mission-critical e-commerce.

"It's a big animal to move," said Dave Kulakowski, a South Bend, Ind.-based development and technology manager at the aircraft landing systems division of Honeywell International Inc. "I don't know that any one company can get you there by itself."

By the end of next month, IBM will release updated versions of its WebSphere application server, DB2 relational database, Tivoli Web management tools and Lotus Domino messaging software. All releases will support the Simple Object Access Protocol (SOAP) delivery mechanism; the Universal Description, Discovery and Integration (UDDI) directory; and Web Services Description Language (WSDL), which defines what services a business offers and how trading partners can electronically access those services.

Rod Smith, IBM's vice president for emerging technology, cautioned that airtight messaging security, transactional protocols and business process schema are all critical and still unavailable pieces of the e-commerce puzzle.

"I compare this to a 10-mile race, and we're still at the half to three-quarter mile," he said.

The finish line is a world in which corporations can freely exchange information both internally and externally, when and how they please. To date, most companies have been challenged to put their own houses in order, attempting to share only limited information over the Web with external parties.

Slow Process

Yet Smith stressed that IBM's latest release will provide off-the-shelf tools to get a lot of firms in the race. He added that vendors face the challenge of convincing users that they can collaborate to build products that will work together.

"Integration is not going to happen quickly," he said. "[Vendors] have always made it real difficult to do business, because we haven't built to standards. These news Web services are an attempt to change that."

Martin Marshall, an analyst at Zona Research Inc. in Redwood City, Calif., said IBM is breaking some new ground by enabling existing middleware for business-to-business usage.

"Wrappering legacy tools has huge potential," he said. "Why? Because [they've] already been debugged."

Yet he argued that giving companies a method to exchange information doesn't solve the e-commerce puzzle.

"It's business process and workflow that is the real nub of this stuff," Marshall said. "That's the level at which things get done. And right now, we don't know if it will be transferrable or if that's where the proprietization takes place."

Microsoft Corp., Sun Microsystems Inc. and Oracle Corp. will also be releasing e-commerce product suites this year. Marshall said he suspects that few of the products will interoperate with those of their competitors, beyond the messaging and directory levels.

Sun spokesman David Harrah said his company plans to support the same Internet standards as those in IBM's release as "a cross-platform, vendor-neutral way of dishing up your data."

Ted Schadler, an analyst at Forrester Research Inc. in Cambridge, Mass., said he expects users to demand that vendors adhere to certain standards like SOAP, UDDI and WSDL but that ultimately, vendors will offer products before many customers have defined what they want.

"They'll do it once in one industry, and then it's ready to sell to everyone else," he said.

On the upside, Kulakowski said, the WebSphere release will allow Honeywell to start pushing out to its suppliers and customers the Java-based objects it has been building internally for the past three years. Honeywell now has Java components on everything from safety reports on its shop floor to tool design needs and tracking.

"My guess is it's going to take a long time to build those connections," Kulakowski said.

The Terminology

▸UDDI: A Web-based business-to-business directory where companies can list contact information and unique identifiers for the Web services they offer.

▸SOAP: A protocol that allows remote procedure calls and Web services to ferry past firewalls, using HTTP as its transport mechanism.

▸WSDL: An XML-based language used to describe the services a business offers and to provide a way for individuals and other businesses to electronically access those services.

IBM Graffiti Artist Ordered to Perform Community Service

Company fined $18,000 for ads

BY LEE COPELAND GLADWIN

A Chicago man accused of spray-painting Linux graffiti ads on Chicago sidewalks for IBM was ordered to perform 30 days of community service in recompense for criminal property damage resulting from his role in an ad campaign that went awry.

The ads' spray-painted "peace, love and Linux" symbols were part of a national push by the company to support the open-source Linux operating system.

The city made IBM pay more than $18,000 in fines to remove 105 sets of the graffiti — a blue peace sign, heart and smiling penguin — from Chicago sidewalks. Blue is the company's trademark color, and the penguin is the Linux mascot.

The fee the company paid included the cost of cleanup plus a $50 fine for each sidewalk defacing, said Ray Padvoiskis, a spokesman for Chicago's Streets and Sanitation Department.

Microsoft License Shift Creates Turmoil

Companies forced to assess impact

BY MARK HALL AND TODD R. WEISS

Microsoft Corp.'s announcement earlier this month that it has restructured its volume licensing and upgrade policies has sent IT managers scrambling to review their current contracts.

While the changes are good news for some, many companies are still unsure what they will mean to their budgets and operations. And some IT shops will be forced into expensive, time-consuming audits of their systems just to see where they stand.

Microsoft said it will extend its Select agreement to three years from two, lower the number of workstations from 500 to 250 to qualify for its Enterprise license, and offer subscription licensing, starting this fall. The company's new Software Assurance upgrade policy will replace a handful of other programs it now offers [Page One, May 14].

At Delta Technology, the Atlanta-based IT subsidiary of Delta Air Lines Inc., spokesman Kurt Ebenhoch said he's not sure yet about what the new licensing provisions will mean for his company's 45,000 Windows-based desktop PCs.

"We are still in the process of reviewing the changes and analyzing what impacts they will have," Ebenhoch said. But because his company is still in the midst of an upgrade to Windows 2000, he said, his initial feeling is that it won't be immediately affected by the pending changes, which take effect Oct. 1. Existing contracts Delta Technology has with Microsoft for support for Windows 2000 will continue to remain in force, he said.

Cloudy Implications

IT shops not currently working on upgrades may not be so lucky.

"A lot of companies are going to spend a lot of time and money just trying to figure out the implications," said Don Bussell, president of Omicron-Chicago, a Gleo Ellyn, Ill.-based independent user organization for large IT sites. Bussell said a lot of IT managers will be running unplaooed audits of every workstation in their company to determine what Microsoft software is on them, which release it is and whether it needs to be upgraded.

"If you doo't have a great asset-management system, it's going to be an expensive pain right now," Bussell said.

Joe Rowell, technology manager at Seattle-based Inchcape Shipping Services Ltd., said his company hasn't concluded what the cost implications of Microsoft's policy shift will be. But he said he isn't concerned about overseeing a time-consuming audit.

Rowell said his company is part of the Microsoft Select program, which means that Microsoft keeps a list of all of the software his company uses. He said he compares that with his own asset management software from Remedy Corp. in Mountain View, Calif., to get a complete view of his licensed software.

While some users privately complained that the change appears to be just another way for Microsoft to make more money, others were upbeat about the new program.

"This is a good thing," said Tom Nolan, director of IT at the American Institute of Certified Public Accountants in New York. "It guarantees stable prices over the life of the agreemeot."

Audit Trail

In the wake of Microsoft's license and upgrade changes, IT managers may need to:

- **COUNT** all workstations and servers.
- **DISCOVER** all Microsoft products on them.
- **DETERMINE** the software release levels.
- **MAKE** software current or remove it from PCs and servers.

Covisint Outsources Entire Infrastructure to Exodus

BY LEE COPELAND OLADWIN

Like many online exchanges, Covisint LLC has been hosted by a service provider since its September launch. But last week, the massive automotive industry exchange set itself apart by outsourcing the rest of its infrastructure, from security and storage to network services, to its host, Santa Clara, Calif.-based Exodus Communications Inc.

Users from several prominent business-to-business exchanges said they have given only a sliver of their operations to Web hosting firms because of concerns about escalating costs, lack of applicatioo control and unpredictable service.

"I'm surprised at the extent that Covisint is relying on Exodus," said Dana Tardelli, an analyst at Aberdeen Group Inc. in Boston. "Most businesses are rooted in internal technologies and they don't want to relinquish that much control."

Officials at Southfield, Mich.-based Covisint said they have been pleased with the service thus far and will extend the contract to include global hosting operations, as well as disaster recovery, security, storage and network services for three data centers.

But gaps in the quality of infrastructure management services have prompted other businesses to ink more restricted service contracts.

FuelQuest Inc., a Web-based catalog for oil and gas distributors, falls into that category. It uses Level 3 Communications Inc. in Broomfield, Colo., for disaster recovery and broadband services. But while its production servers are kept at a nearby Level 3 facility, Houston-based FuelQuest's staff handles application monitoring and problem fixing, said Scott Cilento, director of operations.

Given that the applications are critical to the business, it's important to pay close attention to maintenance, he said.

"We're basically just using their facility," said Cilento. If there's a problem, "a [FuelQuest] stockholder employee is driving out there to fix the issue right away," he explained.

Oracle Corp. hosts GlobalNetXchange LLC's Oracle procurement platform, and the retail exchange's collaborative planning and forecasting services applications are hosted by Manugistics Group Inc. in Rockville, Md. But San Francisco-based GlobalNetXchaoge manages security access rights and services internally.

"One thing that our customers expect is privacy of their data and confidentiality, so we take that aspect very seriously," said Bharat Popat, vice president of product management at GlobalNetXchange.

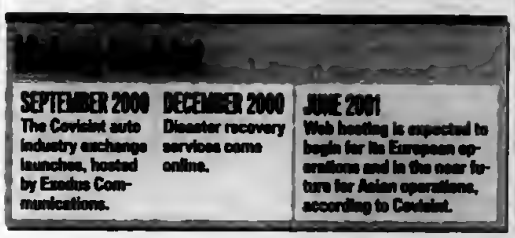
Costs also affect the extent to which business-to-business exchanges outsource hosting and other services.

Michael Ereli, chief technology officer at CheMatch.com in Houston, decided on a hybrid approach to support the online petroleum-based product exchange. Instead of renting hardware and software, CheMatch spent about $1 million on separate servers for development, staging and production applications. The staging and development hardware are kept in-house, but the productioo machines reside at Digital Island Inc.'s data center in north Texas.

"It was cheaper than renting in the long run, if you own the equipment for more than two or three years," said Ereli. Having exactly duplicated environments also makes it easier to make changes and move applications, he added.

Crane Canada Inc., a Stratford, Ontario-based maker of industrial pipes and valves, launched its e-commerce operations in October but found that it was cheaper and easier to set up its hosting infrastructure in-house, said Helene Zonana Cohen, e-commerce director at online unit CraneSupply.com.

"Exodus was too expensive for the type of volume we were expecting," said Cobeo of the CraneSupply.com site, which posts about $400,000 worth of transactions each month.



AT A GLANCE

Hand It Over

Strategies for handing over Web operations to a hosting firm include the following:

- Have internal staff handle monitoring and fix problems.
- Emphasize services that are core to your business, such as security.
- Reduce costs by purchasing hardware and software and ensuring that development, testing and production environments are duplicated.

As Economy Slows, Companies Turn to Supply Forecasting

Proper use of software helps manage risk

BY MARC L. SONGINI

With a giant like Cisco Systems Inc. getting stuck with $2.2 billion-plus in excess inventory, many companies are giving serious thought to damage control systems that handle excess capacity as well as high demand.

Supply chain risk management, although relatively new, could be critical to survival, say analysts. Rather than waiting until the eleventh hour to deal with bloated supply chains and excess production, some companies are using monitoring, event management, forecasting, collaboration and simulation applications to avoid holding excess and rapidly depreciating inventory.

"I feel half my job is risk management," said Benjamin Ma, director of supply planning and management at Sun Microsystems Inc.

Companies using forecasting applications often overstate their needs to suppliers to avoid running out of inventory, said Doug Thomas, an assistant professor of business logistics at Pennsylvania State University's Smeal College. But properly used Web-based forecasting systems that read actual sales data can prevent "suppliers from building huge stockpiles of inventory when a product is not selling," he said.

Such systems can also help companies determine where to distribute inventory when they find themselves with too much on their hands.

For example, Canton, Ohio-based The Belden Brick Co. is rolling out event management software from InterBiz, a division of Islandia, N.Y.-based Computer Associates International Inc., to cope with demand changes automatically.

While the details are still unfolding, Jeff Adams, director of IT at Belden, envisions writing business rules that could notify customers via its extranet when excess inventory is available at a discount, then move it on the fly.

Excess production is a fear in this softening economy, said Adams. "A key customer might tell us, 'We know we want to take a million bricks,' and put in an order, but they might come back three months later and say they don't want all of them," he explained. "That is one of our big concerns, that we don't get too far ahead based on their predictions."

ADAMS: Doesn't want to "get too far ahead" of orders.

Sun doesn't want too much expensive inventory, but it can't afford to have too little, either, said Ma. To minimize risk on both ends, Sun feeds customer survey and field sales data into a supply chain modeling application from Rapt Inc., a San Francisco-based software vendor.

The Rapt tool lets Sun go through various inventory scenarios and see how missing or exceeding different inventory thresholds will affect the supply chain.

FedEx Custom Critical Inc. in Akron, Ohio, which carries individual shipments between businesses, uses sophisticated proprietary systems developed over a period of 20 years to ensure that the right number of vehicles will be available when they are needed most.

Forecasting can be especially challenging because of the changing needs of customers, said Joe Childs, vice president of marketing at the subsidiary of FedEx Corp. in Memphis. A customer may need the firm's services several times in one week, then not contact it again for six months.

Still, "you've got to preplan and have programs in place," said Childs. "There's a high failure rate if you do it during an emergency."

Rival Vendors Update Their Portal Software

Latest versions from BroadVision, Vignette support interfaces to link to legacy apps

BY LEE COPELAND GLADWIN

Web software heavyweights BroadVision Inc. and Vignette Corp. last week announced upgrades to their sparring portal products.

Redwood City, Calif.-based BroadVision released InfoExchange Portal 6.0, an update from the first iteration of the product, which was released last fall. Vignette Corp. in Austin, Texas, unveiled its packaged portal offering, Enterprise Application Portal 2.0, which officials said is the culmination of work the company has done building portals for numerous customers.

Analysts said both products raise the bar in the crowded but evolving portal market, because both vendors bring a high level of expertise in e-commerce and content management.

"Portals unify applications on the desktop, and it's becoming a core communication piece for e-business," said Charles Luce, an analyst at The Delphi Group in Boston.

That's exactly what R.R. Donnelley & Sons Co. is doing with its hodgepodge collection of 1,200 applications used by its 34,000 employees.

Gary Sutula, CIO at Chicago-based R.R. Donnelley, said his IT staff is using BroadVision's InfoExchange Portal and is halfway through whittling its application set to 60 from 1,200. The staff is also building a book portal to get information to customers in a more timely manner. "The book business is a highly transactional business," he said. "And we were spending quite a bit of time in customer service and getting information to our customers, which was really, to be quite honest, a little on the stale side."

Both products offer single sign-on capabilities, which let users access different applications without having to authenticate password and log-in information each time. The portals from both vendors also support Sun Microsystems Inc.'s Java 2 Enterprise Edition specification and offer a slew of interfaces to connect portal applications with existing legacy systems.

Luce added that integrating portal applications with existing legacy systems is a challenge.

"The vendors are doing integration on the front end," he said. "But a lot of companies are facing massive integration tasks because they want their portals to talk to ERP systems or workflow engines or any other major category of enterprise application."

The BroadVision InfoExchange Portal will include a set of portlets, JavaBeans and interfaces for integrating into other applications when it ships next month.

Vignette plans to offer two sets of integration plug-ins with its portal, which is due to ship in mid-July. Pricing for the products wasn't disclosed, but BroadVision said an average software package costs $470,000; Vignette estimated its average package price at $540,000.

AT A GLANCE

Portal Rivals

New portals from Vignette and BroadVision both have:

- Support for Java 2 Enterprise Edition
- Single sign-on capabilities
- A set of application programming interfaces for integrating with legacy applications

Steel Exchange Goes Live

BY MICHAEL MEEHAN

Last week, the Global Steel Exchange officially debuted, allowing companies to swap raw materials and finished steel online.

Founded by Duferco SA in Switzerland, Cargill Steel in Minneapolis, Samsung Corp. in South Korea and Trade-ARBED of Luxembourg's ARBED Group, the marketplace has commitments from its founding members for $5 billion in transaction volumes.

During its one-month beta test, the Chicago-based marketplace managed to trade 257,665 tons of product, with the largest transaction being 48,000 tons of Brazilian pig iron.

Registration is open to all steel buyers and sellers. The exchange offers logistics and financing services as well as steel products.

Competitors include E-Steel LLC in New York and Metal-Spectrum in Atlanta.

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Leading technology that's affordable

Pentium III processor 933MHz
Dual processor capable
128MB(std)/4GB(max) SDRAM
Maximum internal storage of 145.6GB
Integrated 10/100 Ethernet and Ultra160 SCSI
5 available slots/5 available bays
Diagnostic LEDs
Toolless chassis
Tower design with optional 4U rack mounting
IBM Director System Management Software
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BRIEFS

Palm Cancels Merger, Slashes Sales Forecast

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Cross-Platform Database Ready to Go

Filemaker Inc. in Santa Clara, Calif., announced last week that its FileMaker Pro 5.5 is the first software to run both in native mode for Microsoft Corp.'s Windows 2000 and in the new Mac OS X operating system from Apple Computer Inc. The $249 database software product, which is shipping now, will also work on Linux. The release includes new record-locking security features and Web publishing capabilities. It also adds dynamic SQL query functions for integration with Oracle, Microsoft SQL Server and other enterprise databases.

Microsoft Releases Win 2k Update

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IBM, Intel Push Wireless Health Care

Security remains a major concern

BY JULEKHA DASH

Both IBM and Intel Corp. last week joined the growing list of firms partnering with health care vendors to promote the use of wireless technology. But while mobile technology gains ground in health care, security concerns continue to impede its widespread adoption.

IBM announced last Tuesday that it will install back-end systems and provide systems integration and training to clients who use Brighton, Mass.-based PatientKeeper Inc.'s software, which tracks medical records on mobile devices.

The same day, Allscripts Healthcare Solutions Inc. in Libertyville, Ill., and Intel announced that they plan to integrate Intel's PRO Wireless 2011 LAN products with Allscript's software, which automates physician tasks such as prescribing medication and capturing billing information on a mobile device.

As such announcements increase in frequency [*Computerworld.com*, Jan. 26], health care organizations are showing a growing interest in wireless devices, according to a survey released last month (see chart) by the Chicago-based Healthcare Information and Management Systems Society (HIMSS). Half of the survey's 688 respondents said wireless information devices would be the top emerging technology that their organizations would deploy within the next two years, compared with 20% last year.

But in order to persuade hospitals to adopt new technologies, vendors must win over physicians, who control much of the spending, said Richard Telesca, an independent health care analyst in Hartford, Conn. "Hospitals are hesitant to use anything that doctors don't endorse," Telesca explained.

Another obstacle among health care organizations is security, said Jon Bogan, president of Health IQ.com Inc., a health technology market research firm in Duxbury, Mass.

"Security is the No. 1 barrier," he said.

The University of Virginia Health System is waiting until the government releases the final security rules of the Health Insurance Portability and Accountability Act before expanding its pilot of wireless devices for use in capturing patient information in emergency rooms, according to Steve Stearns, director of computing operations.

Once the rules are finalized, Stearns said, he expects that the Charlottesville, Va.-based health system will have to encrypt any patient data on wireless devices. However, he said, he won't know for sure until the regulations come out later this year.

Stearns said there's also concern about the safety of using wireless devices around patients. "There are documented instances where wireless devices interfered with patient-monitoring equipment in intensive-care units," he said.

But some users are ready to overhaul their systems in order to have wireless capabilities for their physicians.

Solomon Appavu, director of systems planning at Cook County Hospital in Chicago, said the organization is replacing its clinical information systems with a product that will let physicians access medical records using a mobile device.

Wireless provides convenience to physicians because it "gives ready access to information, wherever they are," said Appavu.

Top Tools

Top technologies to watch in health care:

	THIS YEAR	LAST YEAR
Wireless information appliances	50%	29%
Web-enabled business transactions	48%	48%
Handheld personal digital assistants	47%	28%
Voice recognition	46%	35%

Base: 688 health care providers. From the 12th annual HIMSS Leadership Survey, sponsored by Dell Computer Corp. and Superior Consultant Corp.

New Features Draw Users to Information Builders Show

Attendees hope to learn new ways to use products

BY JULEKHA DASH

Information about new product features such as Cascading Style Sheets and mobile applications is expected to draw about 600 users of Information Builders Inc.'s Focus and WebFocus business intelligence products to its conference today at Walt Disney World Resort in Orlando.

Several educational and government organizations, including NASA and the Social Security Administration, are scheduled to present ways in which they use Information Builders' data management products. For instance, David Hall, assistant director for the office of planning and institutional effectiveness at Florida International University in Miami, will demonstrate how to develop online training courses to support WebFocus.

Hall said he hopes to learn at the conference how to make Web pages more dynamic using Cascading Style Sheets, which let authors format HTML documents from a single file.

"I know I'm not using [WebFocus] as well as I could," he said. "I use 50% of the capability." Another topic of interest is learning better ways to distribute reports throughout enterprises, said Hall. Last fall, Information Builders launched software that lets users receive information from corporate databases via e-mail on mobile devices.

Henry Morris, a vice president at Framingham, Mass.-based IDC, said he expects New York-based Information Builders to make announcements at the conference about expanding its support for mobile devices. Morris said he also expects that many sessions will discuss creative ways of distributing reports that are simple yet deliver the information that end users want.

Gary Fischer, manager of data warehouse architecture at Park Ridge, N.J.-based Sony Electronics Inc., a subsidiary of Tokyo-based Sony Corp., uses WebFocus to analyze everything from sales to inventory to human resources data contained in SAP AG's R/3.

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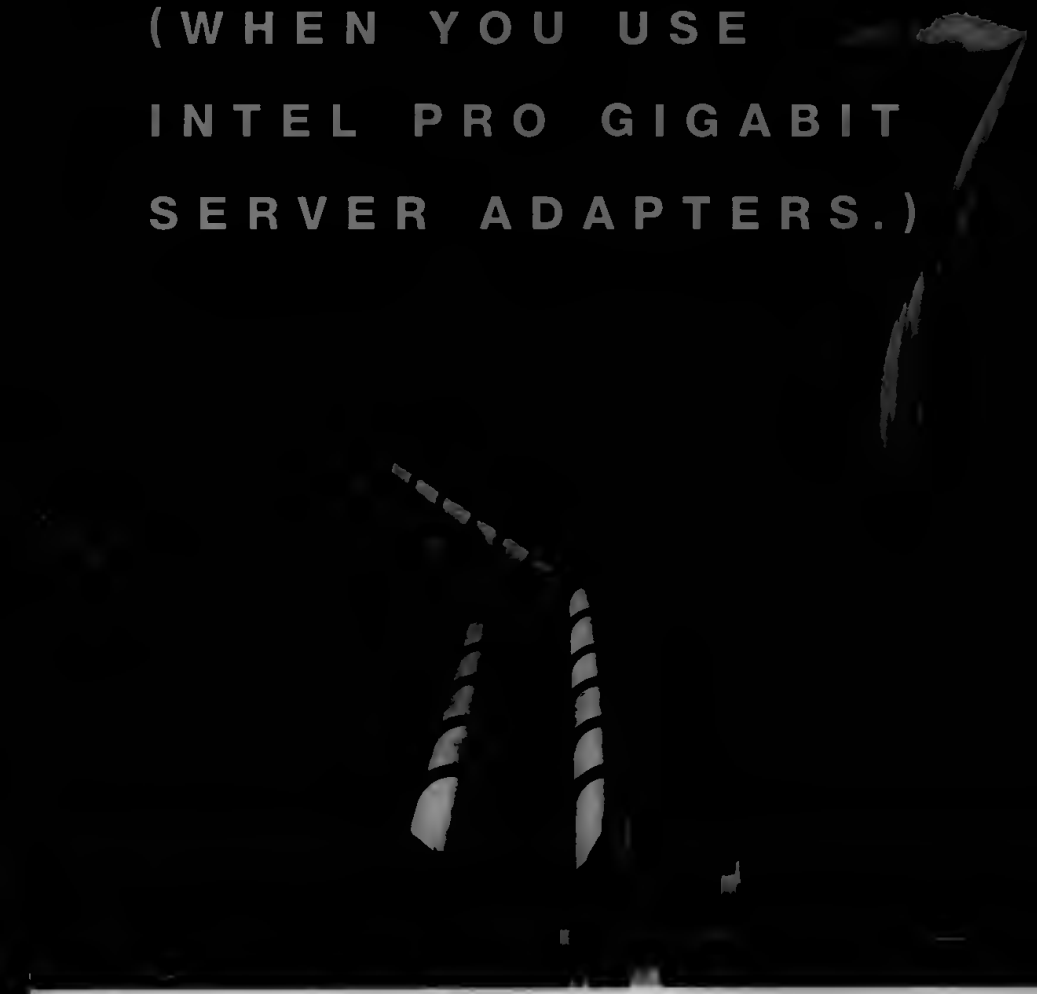

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intel.

E-Mail, Web Access Arrive on Rail Service

Canadian excursion train may be first to offer passengers such services

BY BOB BREWIN

PASSENGERS aboard the Royal Canadian Pacific cruise train, which kicked off its 2001 operating season Friday, can relax in the same luxurious staterooms that once hosted British royalty and Winston Churchill. Now, they can also access their e-mail and the Internet, which may be a first in passenger rail service.

The Royal Canadian Pacific, which operates summer-only excursion trains through the Canadian Rockies, is the first passenger train "to offer e-mail and Internet service in North America and possibly the world," said Steve Barry, editor of *Railfan & Railroad* magazine, from Cartsens Publications Inc. in Newton, N.J.

David Walker, managing director of the Royal Canadian Pacific, said demand for e-mail and Internet access from passengers last year — the train's inaugural season — pushed the company to retrofit the 1920s-era cars with a mobile communications system.

Each passenger stateroom, as well as the train's lounge, contains a standard telephone and modem jack, with ordinary twisted-pair copper wiring connected through an onboard private branch exchange (PBX), said Jim Provost, owner of Calgary, Alberta-based Tele-Com Application Services Ltd. Tele-Com did the wiring and phone and modem installation on the train over a four-month period this winter.

The hardest part of the job was the between-car wiring runs, which were subject to the stress of train movement, according to Provost. "This was the real challenge," he said. "We had to allow some flexibility so the wires would not break from all the movement."

The PBX is linked to a wiring closet that cootains six rack-mounted cellular telephones, which are in turn connected to antennas mounted on the roof of the rail car.

Don Wilkat, service manager at Calgary-based Caltronics Communications Ltd., whicb supplied the wireless gear for the train, said each cell phone is connected to a black box called a "tip and ring generator," which emulates a standard wired phone connection.

"When you plug your laptop in, it thinks it's connected to a landline," Wilkat said. Total cost per line for the gear was nominal, he said, at roughly $300 for the phone and another $300 for the phone emulator.

Passengers should experience connection speeds of 4.8K to 9.6K bit/sec., Wilkat said, depending on the distance of the train from a cell tower and the topography. While far slower than standard dial-up speeds of 56K bit/sec., throughput from the Royal Canadian Pacific will well exceed recently introduced Internet access services oo airplanes, which are limited by low-speed satellite links to 2.4K bit/sec.

Wilkat described the Royal Canadian Pacific wireless system as simple technology, using older but proven 3W analog cell phones and standard telephone wiring. "Yes, it's simple. But it's a good idea to keep things simple," he said. "And it works." He added that other rail carriers could easily and cheaply offer an equivalent service, depending on the mobile phone coverage along their tracks.

The Royal Canadian Pacific is operated by the Canadian Pacific Railway in Calgary, Alberta. ◗

ROYAL CANADIAN PACIFIC passengers can access their e-mail and the Internet from a newly installed wireless communications system.

Enterasys Gets a Jump on New Wireless LAN Standard

But Cisco claims that 802.11a isn't ready

BY JAMES COPE

While equipment that supports 802.11a, the forthcoming 54M bit/sec. wireless LAN standard, won't likely he available for deployment until sometime next year, one vendor has decided to jump in early, to the chagrin of its competitors.

Enterasys Networks Inc. in Rochester, N.Y., said it will introduce this summer a wireless LAN access hub called the RoamAbout2 that supports the new standard.

Wireless LAN bubs receive and transmit wireless signals between the end user and the wired LAN. Most existing hubs use the 802.11b IEEE specification, which supports wireless traffic at 11M bit/sec. But according to Enterasys, its new device is a dual-slot chassis that will hold not only the 802.11b card, but also a yet-to-be-released 802.11a card.

Enterasys promoted its device at Networld+Interop two weeks ago, which seems to have riled competitors. Last week, Cisco Systems Inc. issued a statement specifically addressing the Enterasys announcement and told *Computerworld* that it doesn't believe 801.11a is ready for prime time.

Wireless LAN provider Proxim Inc. in Sunnyvale, Calif., weighed in last week, saying it would incorporate 802.11a into its Harmony line of 802.11b products by selling 802.11a-specific access bubs instead of dual-slot hubs that handle both specifications. Proxim's reasoning: 802.11a won't likely transmit as far as 802.11b, which means a dual-slot approach could leave holes in wireless coverage.

James Wiedel, director of networking at the University of Southern California in Los Angeles and an Enterasys wireless LAN customer, called Cisco's reaction "typically Cisco," noting that, "Cisco always wants all of your business."

Wiedel has already ordered some RoamAbout2s. "They'll let us run 11b now, and in the future, all we have to do is drop in an 11a unit, and it will run it, too," he said.

Wiedel said he's concerned that Cisco will end up with a proprietary 802.11a system that works only with other Cisco equipment.

J.P. Garvin, assistant director of information systems at the Johns Hopkins School of Public Health in Baltimore, disagreed. While the 11M bit/sec. wireless Cisco Aironet system he has installed to serve 1,500 students does include mostly Cisco network interface cards, he said he also tested 802.11b cards from Dell Computer Corp. and from Agere Systems Inc. in Allentown, Pa., with the Cisco wireless access hubs.

"They work just fine with the Aironet," Garvin said.

John Smolek, a researcb analyst at IDC in Framingham, Mass., said the faster 802.11a specification might he right for high-bandwidth applications but isn't necessarily appropriate for those that require the longer reach of 802.11b.

An Enterasys spokesman said that RoamAbout2 will list for $1,900 per access point with transceiver cards in both chassis slots and will be available in July. But the 802.11a card won't ship until late this year or the first quarter of next year. ◗

We have a 17,500-mile, TIER 1 NETWORK, *billion-dollar partners and something else you wouldn't expect from an Internet company.*

A HISTORY.

Leading suppliers of managed Internet infrastructure and services don't just spring up overnight. So where did we come from?

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Innovation is in our blood. And now we've combined our expertise in Web Hosting, Internet Access, Transport and Security into a scalable and secure, ready-to-launch eBusiness Network Platform called *Black Rocket.*™ Our team of "Rocket Engineers" can ensure your project runs smoothly from the start, allowing you to reduce the time, cost and complexity of building and deploying eBusiness.

Black Rocket™ is Genuity's eBusiness Network Platform.

Put our 30 years of experience to work on your eBusiness. Visit www.genuity.com/blackrocket or call 1-800-GENUITY.

A BRIEF HISTORY

BBN

In 1969 BBN was hired by the U.S. government to develop the ARPAnet, the forerunner of the Internet

GTE

In 1997, BBN was acquired by GTE, the company that created our high-speed, 17,500-mile Tier 1, fiber-optic network.

GENUITY

In 2000, GTE Internetworking became an independent company, renaming itself Genuity. Today, we offer a vast array of managed Internet services, including *Black Rocket*™

GENUITY™

BRIEFS

New IIS Patch Offered

Microsoft Corp. is urging users of its Internet Information Server (IIS) software to install another patch, this time to plug three newly discovered security holes and to correct errors made in a trio of earlier patches developed for the Web server package. Separate versions of the patch can be downloaded for IIS 4.0 on systems running Windows NT 4.0 and for IIS 5.0 on Windows 2000-based servers.

Write Virus, Win Prize

Antivirus vendor GateKeeper LLC in Leesburg, Va., is launching its second virus-writing competition today. The prize: $10,000. The challenge: to get a new virus onto s decoy desktop inside the GateKeeper network, something that took three weeks to accomplish in last year's contest. While GateKeeper claims that the contest helps it develop better products, it has drawn fire from the IT and vendor community.

If It's Not One Worm ...

A worm called VBS.Hard.A@mm showed up in users' in-boxes last week disguised as a virus alert from Symantec Corp., the antivirus vendor said in a virus alert.

If a user opens the attachment www.symantec.com.vbs, the user's default Web page is changed to a fake Symantec virus information page, and the worm then sends itself to everyone in the infected PC's Outlook Express address book. However, Symantec said the worm is low risk and doesn't cause serious damage.

... It's Another

Another Visual Basic Script worm spread itself to users of Microsoft's Outlook e-mail software last week, although security analysts said most of the infections took place outside the U.S. Several antivirus software vendors posted advisories about the new worm, which has been dubbed Mawanella, the word that appears in the subject line.

White House Rewriting National IT Security Plan

Says it will oppose regulations that force businesses to upgrade security

BY PATRICK THIBODEAU
WASHINGTON

THE BUSH administration has begun an effort to reorganize and rewrite the federal plan for protecting the nation's largely privately owned critical infrastructure.

The White House contends that the existing plan isn't helping businesses strengthen their IT security defenses.

Administration officials began selling their new approach to businesses last week with what appeared to be a good cop/bad cop routine: The good-cop administratioo says it will oppose new regulations forcing businesses to upgrade IT security, but it warned that the bad-cop Congress will act if a major cyberincident damages or cripples part of the nation's infrastructure.

COMMERCE'S Juster: Congress may pass unwelcome security laws.

"The fact that new laws and regulations might be ill-conceived or ill-advised may not be a bar to their passage, especially if lawmakers and regulators conclude that industry is incapable of self-governance in this area," said Kenneth I. Juster, undersecretary for export administration at the U.S. Department of Commerce.

White Huuse officials said the Clinton administration's 1999 national plan for critical infrastructure protection is flawed because it couldn't be translated into business concerns. The Clinton plan "lacked the reservoir of knowledge" that private-sector executives can provide, said Richard Clarke, national coordinator for security, infrastructure protection and counterterrorism. Clarke was among the administration officials at a national infrastructure security conference held here last week that was sponsored by The Institute of Internal Auditors Inc. in Altamonte Springs, Fla.

In the past several weeks, the Bush administration has embarked on two efforts aimed at gaining greater business iovolvement. First, it's examining whether the present multiagency approach can effectively protect critical infrastructure. Second, it has begun meeting with businesses in industries such as oil and gas, telecommunications, transportation and finance to draft a new protection plan, which it wants completed by year's end.

The new plan will likely retain some of the recommendations of the Clinton administration's plan. Those include funding for security research and development, regulatory relief and continued strengthening of Information Sharing and Analysis Centers (ISAC), which companies can use to share incident reports and information about trends in security. ISACs have been set up thus far in the banking, electricity, telecommunications and technology industries.

Rhonda MacLean, chief information security officer at Bank of America Corp. in Charlotte, N.C., said the ISACs have delivered real business value. "What I have found through that information sharing I do not believe I would have gotten from any other source," she said. "That, I think, really gives us a leg up in being aware of what is actually happening out there."

MacLean suggested that the industry-specific ISACs should include mechanisms for sharing information across industrial sectors, adding that "there is commonality" among sectors.

She also urged the strengthening of federal research and development efforts on security. "Too many vendors are really delivering us poorly developed products," MacLean said. "Not only are they full of operational problems, but they lack basic security controls."

Senator Compares Cyberattack, Nukes

WASHINGTON

The senator who led the Y2k effort in Congress warned last week that a cyberattack by a hostile nation could be as disruptive as a nuclear missile exploding over a U.S. city.

Sen. Robert Bennett (R-Utah), a leading congressional evangelist on protecting critical infrastructure, called on U.S. civilian agencies to adopt the red team/blue team model used by the defense agencies to test their information security defenses. In such tests, red teams are the attacking forces, and blue teams are the defending side.

"The big threat to our security comes from hostile nation states that can muster sufficient resources to make a concerted, significant assault on America," Bennett said last week at a conference here. The conference was co-sponsored by the Fairfax, Va.-based Armed Forces Communications and Electronics Association.

Bennett said these foreign cyberattackers won't attack the U.S. military or its intelligence agencies, where defenses are strong, but instead will aim at the banking system and other targets. If, for example, cyberattackers managed to shut down Fedwire, the Federal Reserve Board's fund transfer system, it could mean that "no checks will clear, no money can be transferred, no financial transactions can take place in the U.S. That will devastate the U.S. more than a nuclear device set off over a large city," said Bennett. "It will cause more long-term havoc."

- Patrick Thibodeau

HP Reports Weak Quarter

BY JAIKUMAR VIJAYAN AND CRAIG STEDMAN

Citing the softening economy, a continued slowdown in its corporate IT business and internal sales and marketing issues, Hewlett-Packard Co. last week reported a 60% decline in pro forma operating profits for its second fiscal quarter and warned that sales may be lower than expected in the current three-month period.

Carly Fiorina, HP's chairwoman, president and CEO, said global economic conditions played a big role in the dampened second-quarter sales. But, she added, HP also continues to wrestle with internal problems.

HP has been tweaking its direct sales strategy during the past few mooths in an effort to deal with channel-conflict problems, which were also blamed for contributing to a sales slowdown in the company's first quarter.

According to company executives, the goal is to address growing concerns that HP hasn't clearly differentiated which users it will deal with directly and which it will allow resellers to approach.

BEST IN BUSINESS INTELLIGENCE

MicroStrategy

	MicroStrategy	Business Objects	Cognos
Full-function All-HTML Interface	●		●
XML API	●		
Microsoft DDBD-compliant Server	●		
Integrated Query, Reporting & OLAP	●	▬	▬
SSL Security	●	▬	▬
Built-in Financial Functions	●		
HTML Email Delivery	●		
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Continued from page 1

Los Angeles

reaching all the goals we have set. There's a laundry list of problems." Chick and other city officials noted that training, or a lack thereof, seems to be the major cause of the problems.

According to a memo issued May 11 by the city's Office of Administrative and Research Services, many departments indicated in detailed reports "that additional training on the new system needs to be provided" to their workers. Bob Jensen, assistant general manager of the city's General Services Department, said extensive training programs are already offered on an ongoing basis, but he added that more training is planned.

The design of the new system and many of the employees who are using it have changed since the initial training was done at the front end of the two-year project, Chick said. In addition, she said, some departments lack employees familiar with how "to run complex technology."

The city is using Pleasanton, Calif.-based PeopleSoft's procurement, inventory management and accounts payable modules. The applications have "bugs like every software package, but we've [reported] them to PeopleSoft, and they've been good at turning them around," said Jensen.

For instance, Jensen, who's overseeing the project for the city, wrote in a report dated May 9 that problems with PeopleSoft's inventory module "have resulted in inaccurate shelf counts" of some supplies. Manual processes for doing the counts have since been implemented, he said, adding that other bugs related to receiving and inventory-replenishment procedures were almost completely resolved this month.

But Jensen said last week that the software bugs can take only part of the blame for the start-up pains caused by the new system. "The procurement problems have to do with people problems," he said. In one case, Jensen noted, employees unfamiliar with the system populated PeopleSoft tables with inaccurate data, causing glitches.

The May 9 memo noted that the help desk staffers assigned to the inventory and procurement system are "helpful, but the demand for their assistance is greater than their availability." The memo also spells out that payments to suppliers are being delayed because of processing problems, causing departments to lose discounts they usually receive. "Some [suppliers] have not been paid large sums of money, and it's costing the taxpayers money," Chick said.

Jim McGlothlin, regional vice president for education and government at PeopleSoft, said the Los Angeles project "was not an easy implementation." The rollout of the new system was a relatively extensive two-year project requiring "business process re-engineering and lots of [internal] changes" by the city, he said.

In such cases, he added, it becomes "incumbent on the users to adhere to the new processes." Despite the bugs cited by Jensen, McGlothlin said that to his knowledge, Los Angeles hasn't encountered any major problems with the PeopleSoft software.

Public-sector ERP projects can be problematic because government agencies often are working on tight budgets and have to accept the lowest bids on system implementation contracts, said Joshua Greenbaum, an analyst at Enterprise Applications Consulting in Daly City, Calif.

Continued from page 1

UCITA

UCITA has been introduced this year in Arizona, Illinois, Texas, Maine, New Hampshire, Oregon and New Jersey, plus the District of Columbia. Opponents are particularly pleased about stopping UCITA in Texas, which was seen as a key battleground state because of its size and the concentration of big companies there on both the user and vendor sides.

The opposition in Texas "just came from everywhere," said Celeste May, general counsel to John Corona, a Republican state senator who sponsored the Texas version of UCITA. "It was basically high tech against everyone else."

About two-thirds of the state legislatures have completed their work for the year, making UCITA's passage in any state this year unlikely, said Carol Ashworth, who is heading an anti-UCITA effort at the American Library Association's office in Washington. But Washington Mayor Anthony Williams has backed UCITA, and the potential outcome there is unclear.

John Palafoutas, a senior vice president at the AEA, a technology industry trade group formerly known as the American Electronics Association, said the legislative showing this year "proves the old adage that it's easier to stop something than to pass something." The Washington-based AEA is a proponent of UCITA.

Palafoutas attributed the hesitancy of states to quickly adopt UCITA to the length and complexity of the proposed law, although he said he was surprised by the intensity of the opposition. "I didn't expect it to be this impassioned," he said. "I think in the long term, we're going to do OK on it. It's complex, and I think it's going to take us some time."

"I think we're just beginning," agreed Randy Roth, director of corporate purchasing at The Principal Financial Group, a UCITA opponent in Des Moines, Iowa. "This was the first year where each party trenched in, and now we're going to go at it for a while."

Even in Texas, UCITA isn't completely dead. Supporters there will make an effort to create an interim study commission to examine the proposed law and to possibly reintroduce it when the state legislature — which has sessions only every other year — meets again in 2003.

In New Hampshire, another state where UCITA has made little progress so far, supporters aren't giving up. State Sen. Lou D'Allesandro, a Democrat who sponsored the bill, said he plans to bring it up again this fall. "I think there is a recognition that we need it. It's just a case of how we refine it," he said.

UCITA was drafted two years ago by the Chicago-based National Conference of Commissioners on Uniform State Laws and sent to all 50 states for their consideration, as part of an effort to develop uniform commercial laws easing interstate commerce. Adoption by the states of such uniform laws can typically take many years.

The legislation sets a series of default rules for software licensing transactions, but the rules have garnered significant opposition from consumer groups and many corporate users. The opponents, who set up a group called Americans for Fair Electronic Commerce Transactions earlier this year, claim that UCITA is too favorable to software vendors.

For example, they charge that the law would let vendors limit their liability, prohibit reverse engineering and shut down software remotely in some instances. But UCITA backers argue that the measure has been misunderstood and erroneously maligned. They say corporate users would still be free to negotiate contract terms.

UCITA has also given rise to a legislative countermeasure called a bomb shelter. States that approve this essentially give users based there the right to dispute a software contract under their home state's law and not the law specified in the contract itself. Iowa and West Virginia have already adopted the bill, and it has also been introduced in Oregon, New York and Michigan.

In addition, the state attorneys general in Kansas and Oklahoma are attempting to modify UCITA. But that effort isn't winning support from UCITA opponents, who see it as a vendor-backed effort to win support for the proposal.

Score Card

UCITA has been sent to all 50 states and the District of Columbia for adoption.

ADOPTED

▸Virginia, Maryland

INTRODUCED BUT GOING NOWHERE FOR NOW

▸Arizona, Illinois, Texas, Maine, New Hampshire, New Jersey, Oregon

UNDER CONSIDERATION

▸District of Columbia

OUTLOOK

▸Many state legislatures meet part time and every other year, so adoption of uniform commercial laws is a lengthy process. All that's clear at this point is that both sides likely face a long battle.

TLD Holders Form Group

BY TONN R. WEISS

A group of Internet top-level domain (TLD) holders has formed a nonprofit association to prevent what they fear will become a splintered Internet domain naming system.

The new group, Top Level Domain Association Inc., began accepting membership applications Saturday.

The best-known TLDs are those recognized by the Internet Corporation for Assigned Names and Numbers (ICANN), including .com, .net, .edu and .org. But many others exist outside the authority of ICANN.

Leah Gallegos, a board member of the new group and president of AtlanticRoot Network Inc., said the new association is being created to recognize all TLD holders, including alternative groups ignored by ICANN.

The problem is that some of ICANN's pending TLD designations, such as .biz, are already used as TLDs outside the official ICANN system. That will create havoc and domain name "collisions."

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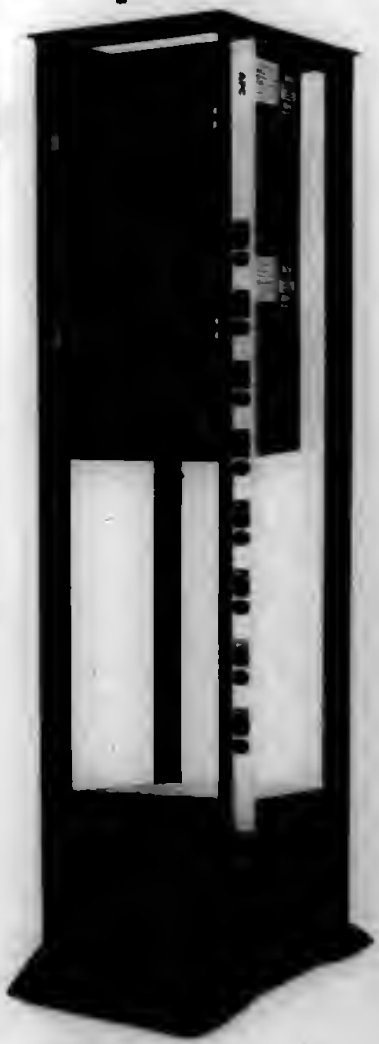

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Users Tussle With Major Lawson App Upgrade

Companies must choose between existing systems and newest version of product

BY MARC L. SONGINI

As Lawson Software rolls out Version 8 of its Lawson.insight enterprise applications, several users are still playing catch-up on the Lawson.insight 7 series.

The St. Paul, Minn.-based vendor is plugging Lawson.insight 8 as a more Web-friendly version than its predecessor, with several enhancements designed specifically for the financial, professional services and public sectors.

Nicor Gas is in the midst of an upgrade from Lawson.insight 7.0.8 procurement software to Version 7.2.3 that it plans to complete in August. But despite any difficulties it may pose, a move to 8.0 is a must, said Joe Hynes, a procurement manager at the Naperville, Ill.-based natural-gas distributor. The upgrade to Version 8.0 is slated for completion by next April.

"We'll be able to take advantage of Lawson's e-procurement services," said Hynes. "We'll be able to go beyond our client/server-based internal catalog and log in to a Web-based marketplace.

"This is a major release," he added. "If we started to downplay it, we'd get blindsided."

However, some users are waiting to see what other companies do first.

"We don't want to be the first to adopt it, and we don't want to be the last, either," said Ted Denca, a deputy director at the Michigan Department of Civil Service in Lansing.

In March, the state went live with the Lawson.insight 7.2.3 human resources module, which handles payroll and benefits for 65,000 state employees and 18,000 National Guardsmen.

Prior to the $47 million implementation, the state relied on 17 million records stored in six different systems; reports were paper-based and often redundant. Managers can now access data using customized viewing screens and can generate and distribute reports on the Web.

Michigan plans to move to Lawson.insight 8.0 by January because the new version requires only a browser and no other client software, which reduces the cost of maintenance, says Rich Huneke, director of the state's human resources management network.

Other organizations are also playing catch-up. "We're a little behind the curve," said Joe Lacik, CIO at Aviall Inc., a Dallas-based distributor of aircraft parts. The company now runs a widespread set of Lawson.insight 7.0.8 enterprise resource planning applications, with plans to upgrade to 7.2.8 before moving to 8.0.

"We hope to get there as soon as possible," he said.

New Treats

The following features are available in the Lawson.insight 8 series:

- Browser-based access to applications
- Connectivity with wireless devices
- A 100% Java-based programming model
- An XML-enabled interface
- Specific enhancements for public-, financial- and professional-sector industries

Microsoft Agrees to Sign Safe Harbor Privacy Pact

BY LUCAS MEARIAN

Microsoft Corp. last week said it would join Hewlett-Packard Co. and other companies that have signed the U.S.-Europe "safe harbor" agreement on data privacy.

To date, Microsoft is the largest company to sign on and could add needed credibility to the self-regulatory measure, which provides a framework to legally and ethically move data between the two marketplaces. The agreement also promises U.S. companies legal protection from Europe's stringent privacy laws.

Adoption of the agreement has been slow, with many companies taking a wait-and-see approach. But Jean Philippe Courois, president of Microsoft Europe, Middle East and Africa, said his company's decision to adopt the agreement reinforces its commitment to "protect our European customers' data and to making sure they feel safe whenever they do business with us."

The provision was negotiated by the Commerce Department under the Clinton administration after the European Commission issued a directive on data protection for its citizens. When HP signed the pact in February, it was the largest company thus far to do so.

MOREONLINE

For more coverage of privacy issues, visit www.computerworld.com/privacy

Interface Designer Targets B2B Failings

Says Web apps need common controls

Mark Rolson is a vice president at Frogdesign Inc., the Sunnyvale, Calif.-based company that designed the physical appearance of the original Macintosh computer and most recently helped hone the look and feel of the Windows XP user interface (UI). Rolson says Web applications pose difficult UI problems for business-to-business developers. Rolson recently spoke with *Computerworld*'s Mark Hall.

ROLSON: Address site complexity by setting "basic but firm" design rules.

Q: What are the current hurdles for UI designers?

A: Translating the design language of UI design away from engineering-driven realities to user concerns.

UI precedent is set by standards being made by engineering limitations. Take the look and feel of Windows, where a lot of the UI treatment is there because the engineering has established the easiest way for a screen to be rendered. Outside of Windows, [in] what part of your life would you put up with that kind of gray and flat space? Not your car. Not your office. SAP R3 — that was a milestone in UI development. It's one thing to take a small system like an MP3 player and make it sexy. But SAP has 50,000 apps with unique events in each of them. To redesign it is a massive, systemic problem. That we were able to do anything for that signaled a shift in engineering's willingness to accept design as part of their process.

Q: Is everything about UI design Web-driven these days? Or can IT developers take a corporate-centric path to their applications?

A: Marketwise, a massive percentage is Web-driven. We do have clients that have traditional C++ apps and are working with them. I don't think there's one app that can't talk via the Web.

But remember, the Web look is basically just a custom look. Every Web site is different. It's not using a standard Windows look and feel. The controls have their own look and feel, and they function differently from site to site.

We're spending a lot of time with companies, such as i2 [Technologies Inc.], to give a standard look and feel to Web applications. A Web UI should follow a similar uniformity like Windows, although it's not at all the Windows look. It's a mistaken assumption that the Web is more usable than Windows. B2B apps are hard to use — harder than Windows. There are user interaction problems everywhere because everything is different, whether it's sorting data, searching data and selecting objects. You've got to learn new objects every time you go to a new site.

Q: What should business-to-business sites do before writing code?

A: The way to solve site complexity is with standard tactics, the controls of objects. ... Set basic but firm rules designers and developers follow. You need a common set of controls so when a user learns it once, they've got it. B2B apps have no commonality. Each company should create their own common control library [and] share it. Sun has done this with the Swing library, as has SAP with its design library.

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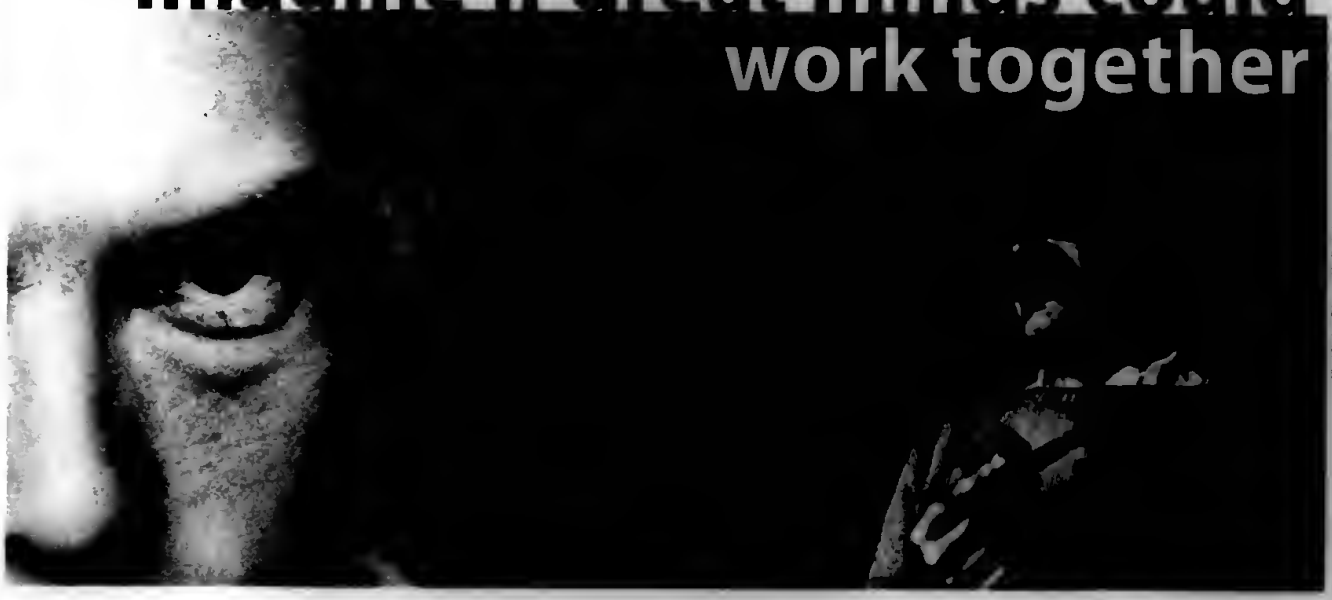

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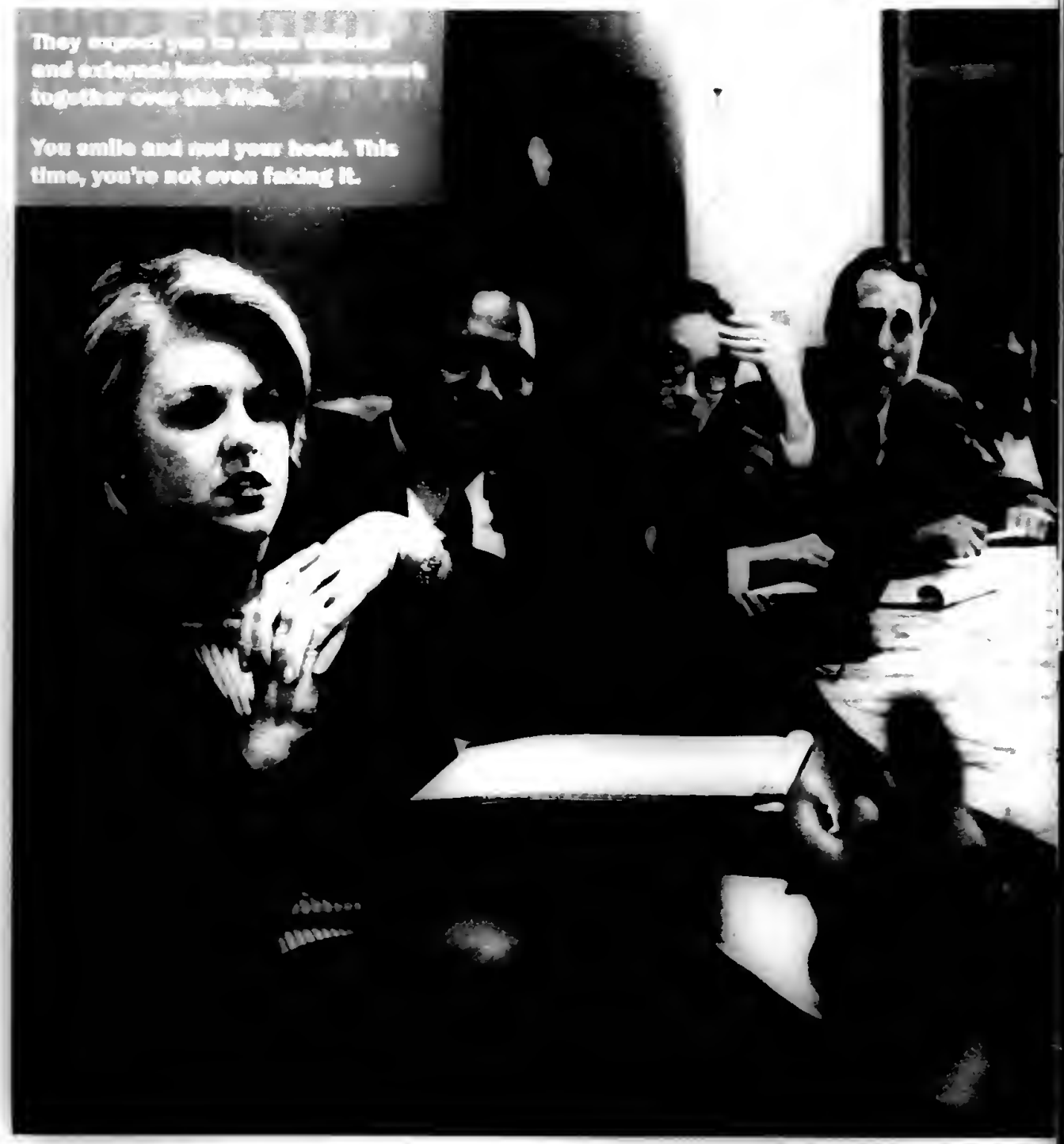

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MARKET FACT

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Microsoft

U.S. State Department Site Hacked; Servers Shut Down

BY BRIAN SULLIVAN

A confidential U.S. Department of State Web site isn't expected to be fully operational until early next month, after an unknown assailant attacked the site and several servers linked to it on May 8.

The FBI and the Bureau of Diplomatic Security have joined the case and are going over system logs to find the point of entry, State Department spokeswoman Victoria DeLong said. They're also attempting to determine where the attack originated, she said.

Currently, the site is used by the State Department's Office of International Information Programs. Some functions, such as e-mail, are still available; Internet access, however, was severed to quarantine the site while officials investigate the attack, DeLong said. Quarantining a site is standard procedure once officials discover that it's beeo compromised, she explained.

"We will not achieve full operational status for at least three to four weeks," DeLong said last week.

"At no time [were] any classified materials or information sensitive to the conduct of national security in danger or compromised," DeLong added. "We don't believe there was a political motive. The State Department's main Web site was not affected."

DeLong wouldn't comment on whether officials believe the attack was carried out by a State Department employee.

Opposing Views

Richard Diamond, a spokesman for House Majority Leader Dick Armey (R-Texas), said the congressman was concerned about the attack. Armey has been an outspoken critic of the security and privacy of U.S. government Web sites.

"This is the reason and an example of why we have to focus on government security first — because the government systems are vulnerable," Diamond said. "The government needs to learn more about how it can protect information before it can start telling other people how they should do it."

Peter Lindstrom, a senior analyst at Framingham, Mass.-based Hurwitz Group Inc., disagreed with the assertion that government sites aren't secure enough.

"In general, I think the government does a great job," Lindstrom said. "In many ways, they are like Microsoft. They are a huge target, and these guys walk around with a target on their foreheads. Every once in a while, a stray shot is going to hit them."

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BRIEFS

Hyperion to Cut Jobs

Less than a month after reporting its second loss in the past three quarters, data analysis software vendor Hyperion Solutions Corp. last week announced plans to cut up to 15% of its more than 2,600-member workforce by the end of next month and said it's also taking other steps to reduce spending by the company. The cutbacks are being driven by the continued economic sluggishness and the effect it's having on software purchases by corporate users, according to officials at the Sunnyvale, Calif.-based company.

Linux Software Vendor Closes Shop

Eazel Inc. folded last week, two months after the launch of its first product: user-friendly open-source desktop software for Linux systems. In an announcement on its Web site, Palo Alto, Calif.-based Eazel explained the closure, which was effective May 15. "Our most diligent efforts were not sufficient to secure additional funding," the announcement said. "We're disappointed that we can't continue developing software and services for users of open-source software. We are confident, however, that Nautilus development will continue forward." Eazel provided open-source software called Nautilus for free download from its Web site.

Networking Start-up Gets $38M in Funding

Former executives from a group of networking and mobile communications vendors that includes Cisco Systems Inc. and Nortel Networks Corp. are forming a start-up that will focus on developing a bridge between wireless networks and existing data networks and the Internet. San Jose-based Tahoe Networks Inc. received $38 million in initial funding from venture capital firms Redpoint Ventures in Menlo Park, Calif., and Accel Partners in Palo Alto, Calif.

Software Glitches Snag 3G Rollouts

British Telecommunications latest to delay

BY MATT HAMBLEN

IN THE RACE to be first with third-generation (3G) wireless services, the winner is still up in the air.

British Telecommunications PLC (BT) last week postponed the launch of its first 3G network on the small Isle of Man in the British Isles, just three weeks after NTT DoCoMo Inc. announced it would delay to Oct. 1 its rollout of 3G in Tokyo.

Both companies fell victim to software problems involving a remote node controller in their networks. The controller doesn't permit users calling outside a single cell to move without losing either voice or data, experts and BT officials said.

BT is working with its subsidiary, Isle of Man-based Manx Telecom, to develop the software with handset maker NEC Corp. NEC is also working with NTT DoCoMo, said NTT officials. NEC and NTT DoCoMo are both based in Tokyo.

"It's a disappointment and a fairly minor glitch in the scheme of things," said Roger Westbury, a spokesman for BT. "Still, the problem meant you'd have an unmobile mobile phone, so that's no good."

London-based BT was planning to roll out the service to 70,000 users at the end of this month, offering video and other multimedia services over phones with bandwidth much higher than the current 14K bit/sec. But the company will postpone the launch until late summer or early fall. "We shan't launch it until we're sure it's working," Westbury said.

The NTT DoCoMo rollout was for 150,000 users in Tokyo but was replaced by an introductory service for only 4,000, with the larger rollout scheduled for October, company officials said.

Analysts said they weren't concerned about the glitch. "A technical glitch such as this is not something to write home about," said Shiv Bakhshi, an analyst at Framingham, Mass.-based IDC. "There are different interfaces involved with content, network distribution and reception on the handsets and to get one to talk to another, which involves a tremendous amount of technical and business coordination."

MOREONLINE
For more information on wireless, visit the community on our Web site www.computerworld.com/wirelesscenter

Phil Marshall, an analyst at The Yankee Group in Boston, said the NTT DoCoMo and BT networks use Wideband Code Division Multiple Access networks, while U.S. carriers such as Kansas City, Mo.-based Sprint PCS Group and New York-based Verizon Communications are developing the service in the narrowband Code Division Multiple Access network. "It's slightly different technology, and we don't expect the same problems" with the U.S. carriers, Marshall said. Redmond, Wash.-based AT&T Wireless Services Inc. is using yet another technology, the Global System for Mobile Communications.

However, Sprint and other carriers aren't insulated from software glitches and delays, said Bakhshi.

"3G is still in development, and these kinds of hiccups are to be expected," said Charles Golvin, a San Francisco-based analyst at Forrester Research Inc. "The rollout has been overhyped."

Promises, Promises

	PROMISED	CURRENT
NTT DoCoMo	May 1	Oct. 1
British Telecommunications	Late May	Late summer/early fall
AT&T Wireless	Q3	Q3
Sprint PCS	Q4	Q4
Verizon Wireless	Q4	Q4

SOURCE: COMPANY REPORTS AND STATEMENTS

Cable & Wireless to Purchase Digital Island

Provider on lookout for more properties

BY JAMES COPE

Cable & Wireless PLC last week dipped into the $9 billion in its cash coffers to buy Digital Island Inc., a struggling content delivery provider that has some big-name clients and a respectable global IP infrastructure.

Analysts said the $340 million purchase brings assurance to existing Digital Island customers that the content delivery service provider will stay in business. San Francisco-based Digital Island, which was founded in 1995, has yet to turn a profit, according to its earnings reports.

"The acquisition underpins Digital Island as a company," said David Woods, managing director of e-commerce for global financial markets at Amsterdam-based ABN Amro Bank NV, a Digital Island customer. "I see this as good news."

The move benefits Cable & Wireless as well, said Brownlee Thomas, an analyst at Giga Information Group Inc. in Cambridge, Mass. She said London-based Cable & Wireless' institutional investors have criticized the carrier for holding too much cash.

Although $340 million is a drop in the bucket for the company, she said it sends a signal that Cable & Wireless is on the prowl for acquisitions. PSINet Inc., an Ashburn, Va.-based service provider that's now facing bankruptcy proceedings, is a possible target, Thomas said. She added that Sprint Corp. could also be on Cable & Wireless' shopping list.

"The purchase of Digital Island is right in line with C&W's vision of focusing only on those things that add value to its international IP network," Thomas said, noting that Cable & Wireless has been selling off property that isn't tightly oriented toward pumping revenue into its global IP network.

Cable & Wireless spokesman Chad Couser declined to comment specifically on the company's acquisition targets.

"There are a lot of good deals out there right now," he said. "But just because we have money doesn't mean we have to spend it. There has to be a strategic fit, value and good management."

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MARYFRAN JOHNSON

Lose the CEO Envy

"MORE DOORS MAY BE opening for CIOs, but are you sure you want to go through them?"

That question from one of our business stories ("Going Up?" page 38) has haunted my thoughts all week. As did this quote from a dot-com CEO and former CIO in the same story: "Many IT professionals are exactly that — they're IT professionals." The point is that most technologists don't reach the executive boardroom because they lack the broad depth of general knowledge required to succeed in the top business spots. Well, here's a politically incorrect thought: Is that such a bad thing?

MARYFRAN JOHNSON is editor in chief of *Computerworld*. You can contact her at maryfran_johnson@computerworld.com.

What we often overlook is the value of deep expertise in a few areas, rather than a smattering of knowledge in everything. Would you really love being the CEO, the ultimate generalist? When I look over the usual lists of qualifications for the top business spot, unequaled expertise in any one subject is never on them. Despite all the grandiose talk about team building, embracing change and strategic vision, CEOs are ultimately judged on the bottom line. Yet we tend to lionize those CIOs who "make it," who survive that final mile to the CEO suite. I suspect these folks would have ended up as CEOs regardless of which profession they started out in. And best of luck to all of them, especially in this economy. But why should it be a big deal anymore to see a top technologist in that spot, any more than a top finance or marketing executive? Companies that don't value technology on an equal footing with finance, operations, and sales and marketing tend to be rather stupid companies.

Of course, technology managers need to be business-savvy and customer-centric. As our columnist Peter G.W. Keen wrote last week, dealing with the pervasive impact of technology has become as much the focus of IT leaders as managing the technology itself. "IT will thrive or fail during the next few years on the diversity of its roles and responsibilities — and of its people and their skills," Keen wrote [Business, May 14].

So if being a CEO is your dream, your technology background won't hold you back. But life is short. Do what you truly enjoy — even if it's "just" running IT. And let the business-types envy you.

PIMM FOX

What's IT Got to Do With 'Mad Cow'? Lots

SAVVY USE OF existing IT resources can be successfully applied to manage complex issues without high costs or long deployment cycles.

Consider some projects in the field of health.

The outbreak of "mad cow" disease in England in 1996 threw the European beef market into a panic. Consumers rejected meat, cattle were destroyed and millions of dollars were lost while governments scrambled to contain the crisis. But they lacked vital information about where cattle were bred, raised and subsequently slaughtered, which could have helped them trace the disease.

PIMM FOX is *Computerworld*'s West Coast bureau chief. Contact him at pimm_fox@computerworld.com.

In Germany, the challenge of building and maintaining a real-time database of cattle and their movements fell to Richard Carmanns at the Bavarian Ministry for Food, Agriculture and Forestry in Munich. His deadline for implementing the system was the end of 1999, after which untracked meat couldn't be exported to other European Union countries. "Some [EU] member states started their projects earlier," says Carmanns, "but we have 16 different states in Germany, and it took time for each state to agree on a common process to tag and track cattle."

The Bavarian ministry relies on three methods by which farmers, cattle traders and slaughterhouses relay information about cattle: postcards that are scanned, an automated voice-response system and the Internet.

When a calf is born, it receives two ear tags, and data (including birth date, sex, ear-tag number of its mother and breeding farm) is entered into a central database. After that, even consumers can know the history of the meat they consume by using an ID on the package. There are 15 million animals registered, and last year, more than 40 million changes related to the lives of those animals were entered in the database.

"While the concept of tracking is simple," says

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Carmanns, "we have over 260,000 farmers, traders and slaughterhouses that handle cattle."

And he had a limited staff and budget for the project. Three people planned it, and two IT personnel handled the operation.

"We used existing IT infrastructure to keep expenses down," says Carmanns, alluding to a database system that distributes EU farm payments. "This is an extension of that IT operation."

About 60% of the data is entered via the Internet or file transfers, with 2% from the voice-response system and the remainder coming from postcards.

Other IT applications underscore the feasibility of using existing database technology to implement real-time tracking and retrieval. For example, the Minneapolis-based National Marrow Donor Program's computer system tracks detailed patient histories and maintains a registry of 4 million potential unrelated donors who volunteer marrow and blood stem cells.

IT projects don't have to eat up huge budgets to be worthwhile or meet deadlines. These cost-conscious projects have proved that existing IT resources can be applied to related projects. ▶

JOHN GANTZ

Prepare Your Company for the Mobile Scramble

ANYWHERE, anytime, everywhere, all the time. That might as well be the mantra for the coming decade.

I'm talking about mobile access to your company's systems from phones, PalmPilots and, perhaps someday, automobiles and wearable computers.

The forecast goes like this: By the end of the year, almost 25% of Internet users in Europe and more than 60% in Japan, where wireless is catching on fastest, will be using a wireless connection at least some of the time. Mobile Internet access will catch on slower in the U.S., but by this time next year, there will be nearly 20 million wireless Internet users here. Within four years, 60% of all Internet users will be mobile some of the time.

Yet research from IDC's massive eWorld 2001 survey (*www.idc.com/eworld2001*) indicates that most companies consider supporting wireless devices something that will be needed in the distant future. Less than 10% of sites today support mobile devices, even in Europe and Japan. Less than 20% plan to add support soon.

In short, demand will soon greatly outstrip the supply of mobile Internet access and applications.

Here's what I think will happen: About a year from now, companies will wake up to the imperative to support mobile Internet users — with remote access for wireless, content formatted for new form factors and new applications and services for their customers — and they'll all try to move at the same time. I call this the mobile scramble. There will be a lot of lousy implementations, a lot of consulting dollars wasted and a lot of unhappy users, at least until companies upgrade and improve their first efforts.

I'm not saying you have to implement futuristic applications like the imaginary service that calls you to tell you your latte is ready, but your employees are going to want e-mail and instant messaging from their wireless phones and access to intranets and extranets. Your customers are going to want to check account status on the road, and your sales force is going to want inventory status. Basic bread-and-butter stuff.

Here's how to get ahead of the scramble:

- Get up to speed on what it will take to support wireless with your internal and external Web sites. Have a plan in place for when the powers that be suddenly make this your top priority.
- Find out which firms offer what wireless Web site hosting and application development services. At least 75% of companies will outsource some or all of their mobile Web sites.
- Set up a technology evaluation unit to keep track of the various standards, devices and services available. Remember, they'll vary by region.
- Start educating business units and management on the unique problems and opportunities created by wireless applications. You know the list: security, device and user management, technical support, directories, etc.

But mostly, you'll have to fight complacency. I don't think demand for wireless applications will evolve steadily. One day, no one will care about them; the next, everyone will clamor for them.

That switch will be thrown sometime around September 2002, when we hit 200 million mobile Internet users worldwide, or about the same number of Internet users in June 1999. You have only 16 months to prepare, so get cracking. ▶

READERS' LETTERS

Security Snake Oil

CHUCK RYAN makes some astute assertions ("The New Security Pro," Technology, May 7), particularly that security professionals focus too heavily on technology solutions without spending appropriate time understanding the business case and performing risk analysis. Firewalls aren't a panacea, though they're often touted as the snake oil that will cure all ills.

Dan Houser, CISSP
Columbus, Ohio

On the Leading Edge

ACCORDING TO "User Worries Prompt New Microsoft Attack on Open Source" (*Computerworld.com*, May 3), Microsoft's Craig Mundie "claimed that the open-source movement could result in 'product instability' and 'inherent security risks' for software users." Another case of Microsoft being ahead of the competition?

David Worth
Database administrator
UPS Aviation Technologies
Salem, Ore.

For IT's Convenience?

PERHAPS running multiple, disparate systems isn't impossible, and standardization is purely for the benefit of IT, not the users of the services ("Standardizing Postmerger E-Mail a Headache for IT," News, April 30). Why yank on users' productivity just to make IT systems more manageable?

Richard L. Bambrell
Director of computing systems and networks
University of Tennessee at Chattanooga

Universal Language

MOST GERMANS call the German-English mixture referred to by Mark Hall ("Global Careerspeak," News Opinion, April 30) "Ginglish." Because most software is available only in English, everyone uses common English terms like *logon*, *save*, *enter* and *file*, even though these words have local translations. In fact, when I took over a product localized in German and English, I was warned not to overtranslate. Germans were so used to the English keywords, they had difficulty understanding the German equivalents.

Celia Redmore
BMC Software Inc.
Atlanta

Containing Viruses

THE COST OF ANY virus attack is normally far higher than anyone realizes and can't be measured only in the direct cost of cleanup ("Antivirus Safety Net Has Too Many Holes," Security Manager's Journal, April 16). When I worked at a bank, a virus infected word processor files and changed figures in the text in an area that approved loans to large corporate customers. The sanction letters were checked on-screen and found to be OK and then sent by e-mail to recipients. However, the virus randomly changed the authorized figures between checking the letters and their being dispatched, so the sender had no knowledge of the change. This resulted in wrong borrowing limits being applied and caused enormous chaos as well as claims and lost interest in the millions.

M. Dickinson
Program manager
Riyadh, Saudi Arabia

COMPUTERWORLD welcomes comments from its readers. Letters will be edited for brevity and clarity. They should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4843. Internet: letters@computerworld.com. Include an address and phone number for immediate verification.

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The alleged Active Directory security flaw

It was reported that Microsoft Windows 2000 Active Directory had a security problem relating to the loss of certain group information.
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Q & A

Compaq server exec reviews market trends

Hugh Jenkins, director of marketing for Compaq's Industry Standard Server Group, discusses what users expect from their servers and how evolving server technology is empowering them.
www.windows2000advantage.com/qa/03-05-01_market_trends.asp

COLUMNS

Don't blame me, I'm only the operating system

The failure to communicate business goals and the misuse of information is blamed on the operating system. Chris Koentz tells how to avoid these problems.
www.windows2000advantage.com/columns/04-23-01_os.asp

CASE STUDIES

Ebone showcases Windows 2000 in a Compaq Environment

Ebone, Europe's original and most experienced data-only broadband optical and IP networking company, entered into an agreement with Microsoft and Compaq.
www.windows2000advantage.com/case_studies/04-23-01_ebone.asp

FEATURES >

Even happy Windows NT users say they will migrate

Despite the allure of Microsoft Windows 2000, many Microsoft Windows NT users have developed highly functional, productive environments that they are content to keep for the near term. By continuing to support Windows NT, Microsoft is enabling these users to make a measured migration to Windows 2000.

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FEATURES >

Windows 2000 ships with key middleware tools for linking, managing distributed applications

With Windows 2000, Microsoft has for the first time bundled many middleware capabilities into the operating system itself as tightly integrated application services, dramatically increasing their performance, reliability and manageability while cutting costs for customers.

For the full story, visit: www.windows2000advantage.com/features/04-16-01_key_middleware.asp

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NEWS >

Whistler renamed Windows 2002

In an address to Gartner Inc.'s recent "Windows 2000 and Beyond" conference, John Enck, Gartner's research director of Server Strategies, revealed that Microsoft's enterprise server products, previously code-named Whistler, will be released under the name Windows 2002.

In February, Microsoft announced the official product name of Windows XP, the company's next-generation desktop operating system, which had previously shared the Whistler code name with the server products.

Both the new server software and the desktop operating system are based on the strengths of the Windows 2000 code base, but they belong to different product families.

According to Microsoft, Windows XP – which will come in Home Edition, a Professional Edition and a 64-bit version – establishes the new standard in power, reliability, security and simplicity for PC users. But the newly named Windows 2002 reflects the needs and requirements of a broad range of business computing requirements: small businesses and departmental/workgroup customer needs; enterprise customers' quest for manageable, secure line-of-business systems; and Web-centric customers who require the highest levels of reliability and scalability.

"Windows 2002 represents the next step in the evolution of Windows 2000," says Mark Perry, senior director of Windows .NET Server Marketing.

For the full story, visit: www.windows2000advantage.com

QUOTE OF THE WEEK >

"The Windows 2000 tools we have, such as BizTalk Server, have allowed us to seamlessly integrate into the Sun Solaris-Oracle solution our fulfillment partner uses."

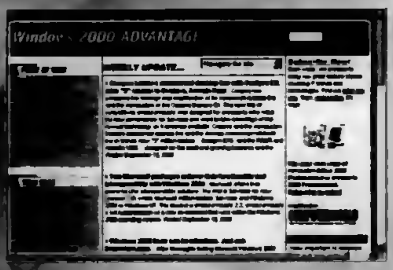
— Mark Sundt
chief technology officer
Haystack Toy Co.

What is Windows 2000 Advantage?

The mission of Windows 2000 Advantage is to become your primary source of timely, useful information for planning and implementing Microsoft Windows 2000 on Compaq solutions and services.

Windows 2000 Advantage is a Web-only magazine because that lets us bring you, the IT leader, great stories that apply to your day-to-day work. We'll keep you up to date with a weekly e-mail alert so you don't miss a thing.

Windows 2000 Advantage is underwritten by Microsoft and Compaq. Its charter is to address the issues that most concern IT managers charged with keeping their companies on top of the latest and best solutions Microsoft and Compaq have to offer. Toward that goal, we offer a wide range of stories including case studies, columns and news to provide you with information you can't find anywhere else.



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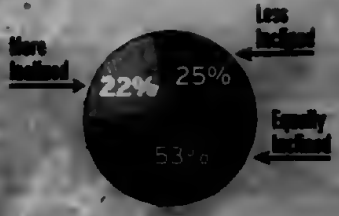

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Microsoft COMPAQ

DON TAPSCOTT

The Net Result: Relationships With Customers

IT'S TRUE THAT your Internet-equipped customers have more information, more choice and more power and that they can jump to a competitor's Web site with the click of a mouse. But it's also true that you can use the Net to build much deeper relationships with your customers than has ever been possible.

Chances are good you have a relationship with Amazon.com. The company has invested in customizing an environment for you. You've invested in educating it about you, your shipping preferences and your interests.

DON TAPSCOTT is chairman of Nomus Inc. (www.nomus.com) and co-author of *Digital Capital* (Harvard Business School Press, 2000). Contact him at dtapscott@nomus.com.

In the interactive world, Amazon can get to know you, educate you and deliver value-added services on a personal basis. It can e-mail you when a new book fits your personal profile. The relationship is mutual: You create value for the seller and for other participants by contributing your views. You can establish a personal profile that includes a gift registry.

The more time and effort you invest, the more personal the bookstore becomes. You build loyalty to this company, not just because of the services it provides, but because of the effort required to re-educate another company about you. For both buyer and seller, this networked relationship constitutes capital.

Amazon.com can seek a greater share of your disposable income by cross-selling new products and services. This year, it scored 84 out of 100 on the American Customer Satisfaction Survey — the highest score ever recorded for a service company in any industry. Because of this, Amazon is one of the most successful brands in the world. The retailer this year will serve 25 million customers and enjoy revenue of more than $3 billion, and it's on its way to profitability.

The wealth embedded in customer relationships is becoming more important than the capital contained in land, buildings and even big bank accounts. Relationships are now assets. This relationship capital accumulates and provides a new foundation for marketing and sales revenue. A firm's ability to engage customers, suppliers and other partners in mutually beneficial value exchanges determines its relationship capital.

Think your company's product or service doesn't allow an Amazon.com-like relationship? Think again. As the Net expands in ubiquity, functionality and bandwidth, the opportunities to establish deeper relationships continue to grow.

Volkswagen operates *www.radiovw.com*, an Internet radio station that streams the catchy tunes VW uses in its hip television commercials. It also offers other tunes that were considered for use in the commercials but didn't make the final cut. Like a tune and want to buy the CD? Drop by your local VW dealer and pick it up. The VW Web site offers a host of features that have nothing to do with running a vehicle. The intent is to deepen customers' belief that VW understands their values.

The customer-facing aspects of relationship capital require a profound rethinking of marketing. For the first time, companies can forge two-way, interactive, personalized relationships with all customers on a mass scale. While the virtue of deep relationships was always self-evident in theory, it was rarely practical before the Net.

WILLIAM M. ULRICH

Remember Cobol? If You Don't, Get Reacquainted

WHEN I MENTION the word *Cobol* to IT people, they look at me as if I just awoke from a 20-year coma. Many IT professionals consider Cobol, like Latin, to be a dead language. But rumors of Cobol's death have been greatly exaggerated. Companies can't ignore their Cobol software assets and need to incorporate them into their IT strategies.

WILLIAM M. ULRICH is a management consultant and President of Tactical Strategy Group Inc. Contact him through www.tacticalstrategygroup.com.

IT people treat Cobol like a pariah. Most universities have dropped it from their curricula. Vendors shun the word *Cobol* in their marketing literature, even when Cobol tools are responsible for much of their revenue. Programmers who know Cobol tend to de-emphasize it on their résumés.

In spite of its reputation, Cobol remains a resilient force in IT. Dale Vecchio, research director at Gartner Inc., says there are roughly 180 billion lines of Cobol worldwide. This isn't surprising, given that Cobol has been around for more than 40 years. What *is* surprising is Gartner's comment in a February research note stating that 15% of all new application functionality through 2005 will be in Cobol.

In the same research note, Gartner stated that 80% of all deployed applications through 2004 will include legacy extensions. These extensions involve Web-based applications triggering legacy system transactions that perform operational business functions and access legacy databases. In January's issue of "The Cobol Report," Scott Ankrum wrote that CICS transaction volume grew from 20 billion a day in 1998 to 30 billion a day this year. This 50% growth in mainframe usage has largely been driven by Web-based systems accessing back-end Cobol applications.

Cobol is not only alive and well; it continues to evolve as well. It supports object orientation and Internet communication. Developers can also create Cobol components to run under Enterprise JavaBeans architectures. And Cobol remains one of the most portable languages. Collectively, this means that programmers can use Cobol for the development of strategic Web-based systems.

So, Cobol is still a valuable corporate asset. Here are five ways IT can leverage it during the next decade:

- Protect your Cobol talent. The number of Cobol programmers is shrinking, with many headed for retirement. Consider bonus programs for them.
- Inventory and document your Cobol portfolio. If your company loses Cobol talent, you must know which Cobol systems perform which business functions.
- Leverage Cobol applications as a source of reusable components that can be used in the design and development of new applications. This may require a Cobol compiler upgrade.
- Make sure analysts have access to tools to help them analyze and upgrade Cobol systems. There are some good Cobol reverse-engineering tools that also help derive Cobol components for reuse under Enterprise JavaBeans architectures.
- Recognize the need for new Cobol skills to upgrade existing systems and build new functionality. You may need to enhance in-house training programs and rethink hiring plans.

IT may need to launch an awareness campaign to gain funding support for these action items. One way to do this is to remind management that the replacement cost of these systems, conservatively estimated at $25 per line of code, is typically in the billions of dollars.

Cobol has outlived newer programming languages, hardware platforms, operating systems and Y2k. It's not going away and must be leveraged to meet strategic business requirements in a timely and effective manner. So, revisit the role Cobol plays in your corporate IT plans.

BUSINESS

WIRELESS TRACKING

U.S. businesses have steadily increased their use of wireless devices during the past few years, but wireless is just beginning to catch on in the supply chain. The early pioneers say it can increase efficiency and, eventually, bring about major cost savings. ▸ 34

MAKING THE ULTIMATE LEAP

Not too long ago, the idea of a CIO making the move to CEO or even chief operating officer seemed absurd. But as IT's importance grows, such moves are becoming downright commonplace. ▸ 38

THE RIGHT STUFF

Forward-thinking CIOs are making sure their IT staffers have the right technical skill mix needed to help their firms meet current and future business needs. ▸ 44

IS BANKRUPTCY THE END?

Bankruptcy filings are making plenty of headlines these days, but the "B word" doesn't have to be the kiss of death for companies. ▸ 48

MORE

Advice 49
Opinion: Ed Yourdon 36
Workstyles 36

DEBORAH THORNHILL

COLLEGES BURST WITH IT HOPEFULS

FIRST THE GOOD NEWS: THE NUMBER OF STUDENTS in IT college degree programs is way up this year. Now the bad news: Even as interest grows among students, demand from corporate America for entry-level IT talent has plummeted, leaving graduates scrambling for job offers.

46

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Companies Test Their Wireless Supply Chain Wings

BY MARC L. SONGINI

Aircraft parts distributor Aviall Inc. is cautiously spreading its wings to speed up the management of its customers' inventory using wireless technology.

With the need for real-time, accurate inventory data in the supply chain, Aviall, like several other companies, is turning to handheld technology [News, March 5]. Although mobile systems have been around for years, their use in the supply chain is just beginning to catch on, say observers.

"Is it a trend? Maybe it is the beginning of one, but it looks like the wireless environment is embryonic," said Scott Stephens, chief technology officer at the Supply Chain Council Inc., a cross-industry consortium based in Pittsburgh.

Taking It Slowly

Aviall plans to adopt wireless slowly, said CIO Joe Lacik. The $500 million Dallas-based company just this month launched a wireless pilot, using devices from Holtsville, N.Y.-based Symbol Technologies Inc. to speed up inventory replenishment for customers.

Currently, Aviall salespeople go from bin to bin in customers' warehouses and manually check stock levels to see what needs to be reordered. With the new system, salespeople will be able to scan bar-code labels on bins to immediately determine whether they need refilling. All of the data is uploaded via the Web to the Aviall back-end replenishment and enterprise resource planning systems, and the fulfillment process can start within minutes of scanning.

JOE LACIK: Handhelds will eliminate time-consuming manual processes.

Eventually, the company's larger customers will be able to do the scanning themselves, saving Aviall as much as $1 million per year in time and manpower, said Lacik.

"That's the tangible dollars and cents," he said. "The intangible part is the statement we are making to our customers that we are continually finding better ways to service them."

Using wireless devices is helping Nicor Gas, a Naperville, Ill.-based natural gas distribution company, ensure that warehouse personnel stick to formal processes. Nicor went live this month with a radio-frequency-based system using devices from TS-Tek Inc. in Lakewood, Colo.

"The system gives us discipline in the overall materials-handling processes," said Pat Loftus, a regional maintenance manager at Nicor.

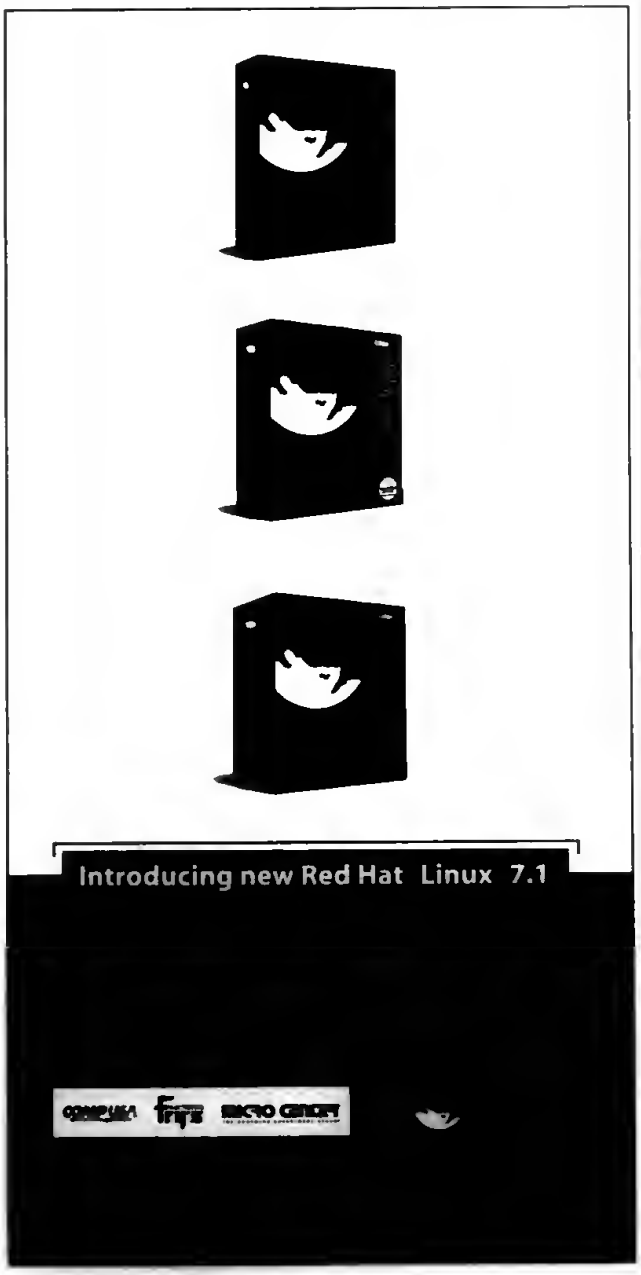
Personnel use bar-code scanners to automate generation of purchase orders and the sending and receiving of goods. The device beeps if inventory items are scanned improperly or placed in the wrong bin.

The data is then fed immediately into Nicor's back-end systems, ensuring that it has current, valid information about its stock levels. Previously, it could take two to three days to determine the status of a piece of inventory.

Nicor can also do widespread checks on inventory levels in a day, whereas before, it could take three or four days, which would require overtime for workers. The system, which cost less than $100,000, should pay for itself within a year, according to Loftus.

Hunt Corp., a Philadelphia-based manufacturer and distributor of office supplies, is considering installing wireless technology in the company's supply chain but hasn't detailed any plans yet.

Wireless could offer a faster and more reliable means of communication with supply chain customers and partners than current hard-wired Internet or electronic data interchange methods, said Ted Raiman, a supply chain director at Hunt.



Online Woes Push Toy Retailer Into Chapter 11

Specialty toy retailer Zany Brainy Inc. last week filed for Chapter 11 bankruptcy protection due to a financial crunch caused partly by problems at its e-commerce unit, which has temporarily stopped taking orders while redesigning the company's Web site.

Tom Vellios, Zany Brainy's president and CEO, said in a statement that the King of Prussia, Pa.-based company has been struggling to cope with a "substantial investment in our Internet strategy," as well as the opening of new brick-and-mortar stores and the acquisition of stores from a rival retail chain.

The company said it has signed a deal to receive $115 million in debtor-in-possession financing from Boston-based Wells Fargo Retail Finance LLC, subject to bankruptcy court approval.

– Craig Stedman

Technical Agility

The smart way for major companies to use their millions in IT spending power isn't just to hammer down the price of laptops and good service contracts, according to IT acquisitions specialist Jon Carrow. Buyers who can match the expectations of business planners with the architecture being built by IT make the company not only efficient but also technically agile, he says. Computerworld features editor Kevin Fogarty caught up with Carrow for a download on how his 15-person department in Radner, Pa., keeps IT purchasing agile for Madison, N.J.-based American Home Products Corp.'s 57-country, 35,000-user operation.

WHO IS HE?

Jon Carrow, director of global IT sourcing and acquisitions at drug maker American Home Products Corp.

What do you mean by "technically agile"? *Technical agility* is a phrase I came up with trying to wrestle with the availability and change of technology — and the speed [at which] new technologies are released. Technical agility is the ability to quickly and smoothly adapt to or integrate current technologies with newer, different, disruptive, expansive or convergent technologies.

The faster that technology comes out, the faster you need to figure out how to bring it into the business and make use of it to get a return from the technology. Companies [that can] acquire that technology in a fashion that matches to their business strategy and their IT strategy and [who can develop] a plan for the eventual movement off of that technology will become more agile in the ability to change their business and adapt to changes in the market.

Behind the IT strategy, you have to have an IT architecture — infrastructure and tools that you're assembling today — that will be one step ahead of where your business strategy needs to be. If [in planning your purchases] you're looking at a one-year picture of an environment in a typical budget cycle, you can't tell what you're investing in, what you're divesting from.

The acquisition group that works with an IT architecture group unfolds that one-year picture into a map so that you can see multiple years of that same picture. If you have that picture when you make key investments in a database strategy or in bandwidth, you can ask whether it's something you'll be growing in size, whether it's a one-off project that has no other piece, or if it could become a potential standard within the business. If so, you can standardize that before the vendor knows they're becoming a standard and leverage your price down quite a bit. You can get terms in your agreements that allow you a lot of flexibility — things like platform independence or processor independence or version upgrades or the ability to prevent a vendor from splitting product enhancements in two and calling it two different products. You can really work the terms so that you have a very malleable agreement. And in IT, the more malleable your terms, the more technically agile you have made your organization.

What kinds of technologies and structures do you need in order to get that multiyear view? One of the cornerstones is enterprise asset management, which you use to really get a picture of your environment, and to some extent, [to] try to keep track of assets so that you don't lose an accounting of who's running what, where, how many you own, and ultimately, what it's really costing you to run that environment. The back end, of course, is, as you retire these assets, you need to know where they are, how to get rid of them [and] that you did get rid of them.

Other structures and tools would also include a business strategy and an IT strategy document. It's pretty tough to develop a multiyear investment picture unless the business has laid the groundwork. Organizational setup is also critical. Many organizations still operate in a decentralized fashion when it comes to IT management. While full centralization has its drawbacks, companies that adopt a shared-services IT organization with respect to the management of their infrastructure and global applications will have a better chance than others in developing executable long-range planning.

Do you have a ballpark figure for how much this approach saves compared with not handling IT acquisitions on a companywide level? Well, the hard savings that we can point-blank justify without getting into any of the soft savings is around $60 [million], $62 million over three and a half years.

On an IT budget of how much? My group has spent about $400 million over those three years. ▶

WORKSTYLES

Teen Leads Software Development At Chicago Customer Service Firm

Interviewee: Jared Brown, lead developer
Age: 19
Company: Lightflow.com Inc., a developer of Java-based online customer service software (product is still in beta)
Main location: Chicago
Number of IT employees: 10
Number of employees (end users): 15
When did you join Lightflow? In March 2000, as a paid intern; he became a full-time employee in September.
How did you convince them to hire you, given your age? "I had developed a remote [systems management] program called PC Annex for a class in school. I had a network at home, and administering it meant running up and down the stairs a lot. So my motivation was laziness.

"Afterward, I had posted it to the Net and was e-mailing it to different companies. Lightflow saw it and was interested in integrating some of its capabilities into their product, so they gave me an internship. Part of my initial work was translating my program from Visual Basic to Java."

What It's Like To Work at...

What has been most difficult about taking a high-pressure job at your age? "The hours are strenuous, and when deadlines and important demonstrations approach, I get nervous and excited. The best thing about the job is the intense satisfaction and adrenaline rush that occurs during a successful demo [or] investor meeting."
College plans: To start a computer science degree at Evanston, Ill.-based Northwestern University's McCormick School of Engineering in the fall. "Education is the most valuable thing that you can have. I'll always keep my education up-to-date with regard to languages."
What would you be doing if you weren't working at Lightflow? "Studying computer science at the University of Toronto. (I'm from Toronto originally.) I didn't know for sure until this year that I wanted to be a developer. I knew I liked it as a hobby, but it was yet to be seen if I would like doing it professionally."
What would you do differently if you could? "I would have saved more of my paycheck. Tuition at Northwestern is extremely high. I haven't been flagrant with my money, but all the expenses add up very quickly."
What do you see yourself doing in five years? "I expect to be working in the IT industry, building software on the leading edge of technology. Quantum computing, maybe."
Major IT initiatives: "We're working on a new release of our software that we hope to finalize, pass [quality assurance] and roll out by year's end."
IT training: "Every member of the product development team is expected to become a Sun Certified Java Programmer."
Bonus programs: There are cash bonuses and stock options for reaching project milestones.
Workday: 9 a.m. to 9 p.m., six days a week.
The one thing everyone complains about: "NorthPoint [Digital Subscriber Line service] shutting down! We were in the middle of transitioning between two T1 lines that weekend, and they were our backup. That ended up being a long, busy weekend."
Last companywide/department perk: "A companywide margarita party two weeks ago – for those of drinking age."
Would employees feel comfortable e-mailing the CEO? "Absolutely."

– Leslie Jaye Goff (lgoff@ix.netcom.com)

ED YOURDON

Mastering Contracts

ALMOST EVERY IT PROJECT TODAY includes some element of outsourcing — for application development, data center operations, Web hosting, end-user training or myriad other details. Sometimes it's a tactical decision ("Quick! Call ABC Rent-A-Programmer! We don't have time to recruit our own Java programmers!"), and sometimes it's part of a larger strategic initiative to divest the enterprise of non-core competencies. But whatever form it takes, outsourcing is one more element today's project managers must master.

We've learned a lot about outsourcing in the past decade, ever since we started negotiating outsourcing megadeals for billions of dollars over a 10-year period. Some of those lessons should be remembered in today's post-dot-com, recession-wary corporate environment; otherwise, we may repeat the mistakes we made with the unrealistic outsourcing deals negotiated during the gloomy economic climate of 1991-92.

First, it's crucial to know whether you want the outsourcing arrangement to be tactical or strategic in nature. If you're building a quick-and-dirty e-business application for some short-term need, you'll want to negotiate a deal that allows either party to walk away from the relationship after the system has been in production for a few months.

But if you're building a complex global system that will require ongoing hardware, software and technical support in 25 countries, chances are, you'll want a relationship stable enough to last three to five years before you have to start shopping for another outsourcing vendor.

In tough economic times, IT managers tend to negotiate outsourcing deals as aggressively as possible, partly because they feel they will motivate vendors to be more diligent about efficiency and productivity, but mostly because senior management will be scrutinizing every cost item to see whether a few more pennies can be saved.

This is understandable, but one of the lessons from the '90s is that a long-term outsourcing relationship won't be stable and healthy unless it's based on a win-win approach. If you're negotiating an outsourcing deal that will last only for the duration of a one-year development effort, maybe you can bully the vendor into accepting terms that will actually cause it to lose money. But if you try to apply this strategy to a 10-year relationship, it will eventually backfire. You can tolerate an obnoxious date for one evening, but an obnoxious spouse is likely to cause a divorce.

Throughout the '90s, we also believed that metrics were the basis for a rational, objective relationship with an outsourcing vendor. Whether you call it quality metrics, productivity metrics or service-level agreements, the basic idea was to quantify every relevant aspect of the relationship to ensure that there would be an objective basis for determining whether the vendor was doing what it promised to do.

Get Some Advice

Today, we realize that while metrics and service-level agreements are the foundation of a healthy relationship, they don't guarantee that conflicts can be avoided. Indeed, the most important part of your outsourcing contract is likely to be the section covering conflict identification, escalation, resolution and de-escalation.

Perhaps the most important development in the outsourcing field during the past decade has been the growth of a mini-industry of advisers, facilitators, lawyers and consultants — including former CIOs — who can help IT firms and outsourcing vendors structure and negotiate complex outsourcing deals that have the best chance of surviving through good times and bad times in the years ahead.

Ed Yourdon is editor of *Cutter IT Journal*, published by Cutter Consortium in Arlington, Mass. Contact him at ed@yourdon.com.

If you're about to embark upon a large, tough outsourcing negotiation, you should track down some of these folks. It may add a few dollars to the outsourcing budget, but it's probably the best insurance you can buy.

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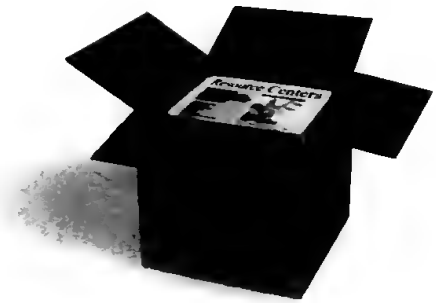

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Going Up?

A decade ago, the concept of a techie in the executive suite was pretty far-fetched. But today, IT leaders with broad visions are making the move not only to CIO but to the top reaches of their firms. **By Melissa Solomon**

When Katherine M. Hudson started her career at Eastman Kodak Co. 30 years ago, she knew the drill.

"You got into one of those silos, and you worked your way up," she says of the preferred method of ascension at the Rochester, N.Y.-based camera and film maker. "You moved up, but never across."

But Hudson couldn't stop herself. She did a stint as a systems analyst, worked in finance and dabbled in public relations, among other things.

Then, to her surprise, things changed. Hudson's broad business background, combined with the one constant in her career — her ability to use IT to help build Kodak's business — made her the natural choice to serve as the company's first CIO, in 1988. In 1994, after being promoted to general manager of Kodak's printing and professional photography divisions, Hudson once again stood out and made the biggest leap in her career: She was tapped to become CEO of Brady Corp., a $500 million sign and label maker in Milwaukee.

"I do think it's tough to run a business if all you've ever had is one function, whatever it is," says Hudson. "The CEO's the consummate generalist."

When MIS directors became CIOs and chief technology officers in the late 1980s and early '90s, they joined an elite corps of executives responsible for the strategic direction of entire companies. But within the past few years, as firms have made massive investments in technology and begun to gamble on new Internet-based revenue streams, more CIOs are following in Hudson's footsteps and going right to the top.

Those who have made the leap tend to possess specific traits: financial savvy, a broad yet clear vision for a company's strategic direction, and a capacity for dealing with the unknown. But more important, they've got "it" — that innate ability to motivate and lead a wide variety of audiences, from stockholders to workers to customers.

When Brady's board of directors created a three-member CEO search committee, board member Peter J. Lettenberger wasn't exactly sure what the "it"

was that be was looking for. But he thought he'd know it when he saw it, he says.

Then along came Hudson. The board was impressed with her experience as a successful CIO, says Lettenberger. But it was more than that.

"Had that been her only experience, I don't think she would have ever been presented to us," he says.

Hudson spoke of work being fun. She talked about building consensus and involving people at all levels to take new risks and reach oew goals. She had "it."

'KEEPER OF THE FLAME'

Historically, if you look at CEOs, their backgrounds tend to reflect the critical challenges companies are currently facing, says Michael Useem, director of the Center for Leadership and Change Management at the University of Peoosylvania's Wharton School in Philadelphia, and author of *The Leadership Moment* (Times Books/Random House, 1998). In the 1960s, CEOs tended to rise from among the marketing ranks; in the '80s, they typically came from finance, he says.

"It may be that for some companies now, what's become absolutely critical is their technology," says Useem.

As one of the pioneers of the CIO-to-CEO shift, Hudsoo isn't the least bit surprised to hear that the oumber of people following in her footsteps is increasing.

"The world has gotteo more global," she says. Who better to lead today than a CIO who has successfully coordinated a global enterprise resource planning system initiative? she asks.

That depends oo the company and the person, says Howard W. Lutnick, chairman of New York-based Cantor Fitzgerald LP, one of the world's largest fixed-income brokerages, and chairman and CEO of eSpeed Inc., its financial e-marketplace spin-off.

At a technology company, the CIO can rise to the top because technology has the closest connection to the revenue, Lutnick says. But at a direct-mail company, for example, chances are good that the job will go to a marketer, he says. So ambitious CIOs looking at job moves should ask whether technology is "in a supporting role, or does it have a front seat?" he adds.

When interviewing CIO candidates at Cantor in 1998, Lutnick knew exactly what he wanted: someone who could move the brokerage from its open-out-

KATHERINE HUDSON meshed her technical background with [illegible]

Top Dogs

Other technology leaders who have made the leap to CEO or COO include the following:

Carl Bass, formerly CTO at Autodesk Inc., is now CEO and president of Buzzsaw.com Inc.

Robert H. Benmosche, who ran IT at Paine Webber Group Inc., is now CEO of Metropolitan Life Insurance Co.

Jim Burns, formerly CIO of North American operations at Swiss Bank Corp. (now UBS AG) and CIO at The Goldman Sachs Group Inc., is now CEO of Itemus Inc.

Michael Capellas, formerly CIO and COO at Compaq Computer Corp., is now its chairman and CEO.

Henry Fiallo, formerly CIO at Cabletron Systems Inc., is now president and CEO of Enterasys Networks Inc.

Deborah Gillotti, formerly CIO at Starbucks Corp., is now COO at Viathan Corp.

Alan R. Guibord, formerly CIO at Fort James Corp., is now Computerworld Inc.'s CEO.

Cinda A. Hallman, formerly CIO at Du Pont Co., is now Spherion Corp.'s president and CEO.

Dennis Jones, formerly CIO at FedEx Corp., is now COO at Commerce One Inc.

Charlie Lacefield, formerly CIO at Dow Corning Corp., is now president of Phios Corp.

Robin Raina, formerly senior vice president of technology at Delphi Information Systems Inc., is now CEO and president of the company, renamed Ebix.com Inc.

Glenn Renwick, formerly CIO of Progressive Casualty Insurance Co., is now its CEO of insurance operations.

Art Ryan, who rose through the IT ranks at The Chase Manhattan Bank to president, is now chairman and CEO of Prudential Financial.

Diego Saenz, formerly CIO at Pepsi Latin America and The Wackenhut Corp., is now COO at PetPlace.com Inc.

Jim Williams, formerly CIO at PacifiCare Health Systems Inc., is now president and CEO of Smart Chip Technologies Inc.

cry system to an electronic trading floor.

"My view of technology development was pretty simple. I didn't think technology was rocket science"; rather, it's all about architecture and engineering, Lutnick says. But he says most of the technology executives he met tried to convince him that the world stood on their shoulders.

Frederick T. Varacchi, on the other hand, "had very much the same view that I did," Lutnick recalls. Varacchi, then chief technology officer at Greenwich NatWest Capital Markets Ltd., was able to explain exactly how his plans would contribute to the bottom line and what it would take to make those plans a reality, Lutnick recalls. "I fell in love with Fred," he says.

Varacchi is good at setting objectives that are attainable but exciting, says Lutnick. As Cantor's CIO, Varacchi not only automated Cantor's trading floor on time and on budget, but in less than two years, he also helped spin off the system into a separate company, eSpeed, which now runs 46 different online marketplaces and transacts more than $200 billion each day. ESpeed generated $43.1 million in revenue in this year's first quarter, a 78% gain over last year's.

Although Varacchi had the capacity to lead, Lutnick says, he was "outside that hub where the flame is kept." So in 1999, after a year as CIO, Lutnick named Varacchi chief operating officer and executive managing director of Cantor. A year later, Varacchi took on the additional titles of president and COO of eSpeed, the company he helped create. Now, says Lutnick, "Fred has become a keeper of the flame."

Having a former IT executive as president places further demand on Joe Noviello, eSpeed's CTO. But Noviello has been with Cantor for six years, "before Fred and after Fred," as he puts it. And in those after-Fred years, he's seen technology evolve from a filling supporting role in the company to being its central focus.

"It's really the visionaries that take what you've established and move it to the next step," Noviello says.

READY OR NOT

The business world might be ready for CIOs, but are CIOs ready for the business world?

"Many IT professionals are exactly that — they're IT professionals," says Nicholas S. Maturo, CEO of Miami-based Foodtrader.com Inc. and former CIO at Kraft Foods International Inc. in Rye Brook, N.Y.

Most CIOs in multinational firms could never aspire to be COO or CEO at those companies, because they don't have the broad depth of knowledge that CEOs need, says Maturo.

Despite the naysayers, several CIOs have climbed to the top of Fortune 500 companies within the past few years. So, what is it that makes them stand out?

It's the intangibles, says Varacchi. Leaders must have vision, focus and drive; they must be great taskmasters and, at the same time, extraordinary motivators, he says. A good leader can walk into an organization and spot the flaws immediately. But, he adds, you have to keep quiet, make a few wins and build a name. Once you've achieved that, management will trust you to lead significant change.

Another critical skill, he says, is the ability to deliver in terms of time and money. A good CIO or CEO constantly thinks, "How can I take this technology and morph it in 10 ways to make more money for the company?" he says.

A company leader must also be tough when necessary, Varacchi explains. The first thing he did when he went to Cantor was "clean house." He laid off about 200 employees and hired 200 new people to redirect the company's focus. He also brought in a few people he had worked with over the years to spread the word that he wasn't a bad guy.

So, how does one learn such skills? Varacchi offers the following advice:

AT A GLANCE

Recipe for Success

Here's what it takes to move from IT leader to company leader, according to those who have made the jump:

- Listen to and learn how to talk to your customers, employees, board members and stockholders.
- Create a solid vision for the company and continually steer it in that direction.
- Build a strong team.
- Set realistic but exciting business goals to boost the bottom line.
- Never implement any project or technology that doesn't advance company goals.
- Deliver on goals, on time and on budget.
- Don't be afraid to be tough and take charge.
- Allocate your resources wisely.
- Embrace change.
- Know exactly what your competition is up to.
- Take lessons from those you admire.

Work with dynamic people, keep your goal clear and stay faithful to it, and educate yourself about the job, the company, its operations, its administration, its sales and its competition.

NO DOT QUALMS

In 1999, Sharon A. Fordham was promoted to Nabisco Inc.'s newly created e-business director position, or what she calls "C-little-e-O."

Global e-business, she realized, was more than just a communications platform; it was also a new revenue channel and productivity tool. So when Fordham got the opportunity to become "C-big-E-O" of New York-based WeightWatchers.com Inc., where technology is at the core of the business, she felt it was too good to pass up, she says.

"Some would say I was off my medication," she joked about her decision to join a dot-com this year.

Fordham remains confident in her choice, but her challenges are extensive. For instance, should the company invest in domestic growth or international expansion? And how much effort should go toward business-to-business initiatives?

Having so many new responsibilities, many of which are being thrust at her as she goes along, will probably be scary, Fordham acknowledges. But "I don't wake up to panic attacks," she says.

"I think you have to be very comfortable with uncertainty, and many people aren't," she says. "If you give up easily, this is not the place to be. This is not for the meek of soul."

A good CIO can cut through the complexities of running a business, stand back and determine where it should go. "Through that process, you become less enamored and less technology-centric and more customer-centric," says Foodtrader.com's Maturo.

Hudson agrees. But the biggest challenge for any CEO is top-line growth: cutting costs and coming up with new products and services to build revenue, she says.

As long as you focus on what your customers really want, you can grow a company, Hudson says. At Kodak, for instance, customers don't want film, they want pictures, so the company developed its digital camera line.

The key, she says, is to surround yourself with a team of people who can help build new businesses.

"The days of the Lone Ranger are gone," she says. Nevertheless, as CEO, "the buck stops here," says Hudson. "If all this stuff doesn't work out, I'm the one that gets fired."

Price of Success

More doors may be opening for CIOs, but are you sure you want to go through them?

Frederick Varacchi, president and COO of eSpeed, says he realized just how high the price of success was when his wife, Eileen, gave birth to their third child on Nov. 15, 1999. Three days later, he headed out for the company's first initial public offering road show, which turned out to be a three-week-long gig.

Varacchi says that if it weren't for his wife, he'd never be able to do his job. "She is overwhelmingly supportive of my career," he says.

Still, like most parents, Varacchi says he wants "to spend more time with my kids. It's a balancing act."

To do this, he tries to stick to a few hard-and-fast rules when it comes to family: Weekends are for the kids (ages 7, 5 and 1); you always try to make the big events, like sports games and class plays; and, most important, "you try never, ever to let your kids down."

To balance out the long hours he puts in at the office, Varacchi makes the time to coach both his son's and daughter's soccer teams in the fall and his son's lacrosse team in the spring.

Katherine Hudson, CEO of Brady Corp., says she tries hard not to let her job take control of her life. There are times when the company has to come first, she says, but in general, it's not healthy to put it ahead of family needs.

"CEOs work 24/7," she says. But Hudson says she tries to limit her actual work hours to about 55 to 60 per week. And on vacation, she takes a fishing rod, not her laptop.

Hudson's life as an executive more is made somewhat easier because her husband is a stay-at-home spouse who cares for their 13-year-old son, she says.

Some IT leaders who have become company leaders find their new roles to be more flexible than previous ones. For instance, Nicholas Maturo, CEO of Foodtrader.com, bounced between the U.S., Europe and Asia during his years as CIO at Kraft Foods International.

"I don't think this is really any more demanding than my prior jobs," he says. "I dragged my wife and children around the world. This is just another assignment."

– Melissa Solomon

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Microsoft

Three CIOs share the methods they use to keep up with technology and ensure that their IT staffs have the right blend of skills to meet current and future business needs. By Kathleen Melymuka

SKILLS FOR TOMORROW

NOTHING CHANGES FASTER than IT. With all the new technologies and technology trends on the horizon, how do CIOs decide which offer the best business value for their companies and how to retool their people in time to take advantage?

Below, three CIOs discuss their differing approaches, which reflect the particular challenges each faces.

Advocacy Approach

PRC Inc., a McLean, Va.-based subsidiary of Northrop Grumman Corp., uses a process called Tech Watch to identify useful technologies, jumpstart projects and re-skill people. An architectural lead team watches emerging technologies, maps them to the appropriate architectural groups and numerically rates them for impact on the business, cost to implement and readiness for deployment (see chart).

SKILLS

"The smaller the final number, the more likely it is we'll be using it," explains Cora Carmody, former CIO at PRC. (Carmody recently left PRC to become vice president and CIO at Herndon, Va.-based Invensys Software Systems, a division of Invensys PLC.)

The top 10 on the current Tech Watch list — which is "subject to change at a moment's notice," Carmody cautions — are Linux, XML, data analysis/decision support, enterprise portals, business-to-business e-commerce, text analysis, customer relationship management, workflow engines, wireless Web protocols and Digital Subscriber Lines/cable modems.

Once Tech Watch charts an emerging technology, anyone from the IT organization can volunteer to be an advocate for it. (During Carmody's tenure, if no advocates came forward, she encouraged individuals to take the lead.) The advocate learns about the technology and the vendors and thinks about how it can make a difference to the company.

"We've got advocates at all levels," she says. "We see it as another way to bring people along, give them an opportunity to explore something and push them further."

Typically, the advocate finds others with an interest in the subject, and they begin to share information and build a technical knowledge base. The advocate may also attend seminars or buy inexpensive tools to learn more. In time, he may present a primer on the topic at a brown-bag lunch, an informal training opportunity that's popular at PRC.

The advocate typically will propose a pilot program to a manager in one of the architecture groups to which the technology maps. He can choose to become part of the pilot project, thereby working into a new job in the new technology area. The manager may send him, along with high-potential people in his department, to formal training in the technology in preparation for the project.

Using this approach, Carmody's group recently implemented business-to-business e-commerce software from Mountain View, Calif.-based Ariba Inc. and realized the tool could also help with internal electronic purchasing. The group used the Ariba workflow engine to automate internal authorization and purchase processes via e-mail.

The new system allowed PRC to cut its internal procurement cycle from 16 days to less than two while decreasing procurement staff. "Think about the savings," Carmody says.

There are exceptions to the advocacy process when it involves a technology that will have a huge impact. "For something like PeopleSoft, we're not talking little seminars. We'd need some very serious training and investment," Carmody says. In that case, she would choose people based on past performance and familiarity with the business functions involved, such as human resources and accounting for an enterprise resource planning system like the one from Pleasanton, Calif.-based PeopleSoft Inc.

In general, Tech Watch keeps the company on top of emerging technologies while enabling people to navigate their careers based on interests and initiative. "Everybody is challenged to take responsibility for his or her career and is given a lot of encouragement," Carmody says.

Everything Old Is New Again

At State Street Corp. in Boston, CIO John Fiore is in the midst of an initiative to add contemporary software skills to the repertoire of his mainframe staffers while upgrading his mainframes with powerful new open-systems tools. Fiore says the mainframe/open-systems integration should give the bank the best of both worlds: new tools and languages adapted for stable, scalable mainframe systems. In addition, the move should enable legacy developers to pick up new skills while working on a platform they're familiar with.

During the past five years, the bank has added browser-based technology to the front end of its systems. Fiore chose mainframe staffers to help, based on their performance and subject-matter expertise in the area under construction. He then immersed them in a comprehensive in-house curriculum ranging from object-oriented tools to Internet technologies. After that, the staffers were seeded to work among new hires chosen for their open-systems expertise.

Although the plan has worked pretty well, Fiore acknowledges that certain delays and initial performance problems with the new front ends could have been avoided had be given people more time to learn the skills and apply them on smaller, less-critical systems to go back for retraining and only then to work on the critical applications.

"Of course, that's easy to say, but time is not always a luxury we have," he says.

Those lessons will be put to use as the bank gradually integrates languages such as Java and C, relational database technologies, TCP/IP and Web server software, which used to be available only in the open-systems environment, into its OS/390 platform.

The initiative began with a series of feasibility studies to assess wben the new technologies were "ready for prime time." TCP/IP, for example, initially had some performance problems running on the mainframe.

As technologies mature, Fiore plans to integrate them into the mainframe systems to dovetail with other activities. For example, if a major new component is being built for a system, he may introduce just-in-time training for Java or C tools to belp with that development.

Since new technologies will be introduced at different points based on their readiness for use and internal development plans, the staff should have time to digest the new tools and concepts one at a time, without suffering the overload that slowed the front-end systems development, he says.

Technology Watch List

PRC developed a Technology Watch list that allows it to keep an eye on promising technologies. A rating of 1 in the Prime-Time Zone means the technology is ready to use now. A rating of 1 in the Impact on Business category means the highest relative impact is expected. A rating of 1 in the Cost category indicates the lowest relative cost to implement. Technologies with the lowest overall scores are the most likely to be implemented.

TECHNOLOGY	TECHNOLOGY TYPE	PRIME TIME ZONE	IMPACT ON BUSINESS	COST TO IMPLEMENT
XML	Data/knowledge	1	1	2
Text analysis	Data/knowledge	2	1	3
Data analysis, decision support	Data/knowledge	1	2	3
Content based on retrieval	Data/knowledge	1	1	3
Audio mining	Data/knowledge	4	3	3

Look Before You Leap

Sometimes the best decision about a new technology is not to deploy it, says Ron Griffin, CIO at The Home Depot Inc. in Atlanta.

"We bypassed most of the client/server platform, which was the Holy Grail at the time,"Griffin recalls, because IT management determined that it would increase total cost of ownership.

Every few years, Griffin says be re-evaluates Home Depot's overall infrastructure, tools, technology and approach, looking for seismic shifts that offer low cost of ownership, manageable life cycles and huge benefits. But to be worth retooling, "it has to be a quantum leap," be says.

During the 1990s, the technologies that best fit the home improvement giant's criteria were TCP/IP and Java. To retool, Griffin hired a handful of people with deep expertise who liked coaching and teaching others.

He also leveraged Home Depot's relationship with Sun Microsystems Inc. "Sun had created Java and was growing it, so they partnered with us to get the organization up to speed, shared their expertise and their road map for the technology," recalls Danny Branch, vice president of information services. "It was advantageous to both of us that we succeed with Java."

Home Depot developed training classes and literally paused projects after the requirements phase to enable novices to be trained just in time.

"We try to make sure we've always got deep expertise on the team and some people who are learning so people grow and expand their knowledge base," Griffin says. "A good percentage of our people have multiple platform skills because of this approach."

Griffin says passing on client/server and diving into Java was the right decision. "It feels like we have tbe best of both worlds: graphical applications without all the client/server overhead," be explains. "Every new application for the last five years has been leveraging that." ◗

DOUGLAS WEIGGS

Enrollments and graduation numbers are way up for MIS and CIS degrees this year. But at the same time, campus recruiting is declining. By Leslie Jaye Goff

A BUMPER CROP OF IT ROOKIES

WHEN SCHOOL LETS OUT for summer break, Anna Kilinski won't be heading for Cancun or Daytona or even for bome. Sbe'll be off to Fairfax, Va., to start a summer IT internship at Exxon Mobil Corp.

Kilinski had ber pick of three internships. She says she chose Irving, Texas-based Exxon Mobil for the chance to work at the top-ranking company in the Fortune 500. Kilinski can even recite all the leaders on the annual listing. This will be her second summer internship, following a stint last summer at Kimberly-Clark Corp. in Roswell, Ga.

One of 300 students enrolled in the MIS degree program at the University of Alabama's Culverhouse College of Commerce and Business Administratioo in Tuscaloosa, Kilinski is among the growing oumber of students enrolled nationwide in business-school programs for management information systems or computer information systems.

Despite cries from industry observers that universities areo't producing enough IT graduates to meet the demand, the number of students entering — and graduating from — business-school MIS/CIS degree programs is rising and has been for the past five years. The demand may outweigh the supply, but statistics from the Washingtoo-based National Center for Education Statistics (NCES) and schools polled for this article indicate that business-student interest in IT careers is rapidly growing.

"We're at 300 students and holding, and we could double that easily, if we wanted to," says Joanne Hale, assistant professor of management and information systems at the University of Alabama. "But our program is very project-intensive, starting with the sophomore year, and we couldn't keep up our quality if we raised our enrollment cap."

Approximately 100 students graduated from Alabama's MIS program in the 2000-01 academic year, says Hale. Even with the enrollment caps, that's up from 75 graduates five years ago, and enrollment has increased from 206 in the same period in 1996-97.

At Southwest Missouri State University (SMSU) in Springfield, enrollment in the College of Business Ad-

ministration's Department of Computer Information Systems has approximately doubled in five years, from 539 students in 1996-97 to 1,062 this year. David Meinert, a professor and student adviser, says he anticipates that 198 students will graduate with the CIS degree this year, up from 72 five years ago.

The increase at SMSU has been driven by students transferring from other majors, as well as career-changers "who feel unfulfilled and come back to pursue their dreams," Meinert says.

"They like solving problems, and they work hard but expect to be recognized for delivering," he adds. "And most of them are interested in professional development, how they can become better IT professionals. They want continued training and to work on cool projects with emerging technologies."

MOREONLINE

For more information on the number of IT graduates, enrollments and campus recruiting trends, see related stories at our Web site: www.computerworld.com/careers

The figures from the University of Alabama and SMSU correspond with national figures released by the NCES. From the 1996-97 academic year to 1997-98 (the most recent data available), the number of bachelor's degrees awarded in business information systems programs grew from 7,048 to 9,393. Looking back over the 1990s, it reflects a continuation of an upward climb.

As the number of enrollments in business-school IT undergraduate programs increases, the schools are turning out graduates who, like Kilinski, are increasingly exposed to real-world experience, hands-on use of technologies, completed live projects and a solid foundation in both theory and applied IT. At the University of Alabama, for example, approximately 75% to 80% of students have had an internship by the time they graduate, Hale says.

Kilinski says she was surprised to see how much she knew once she was on the job. She says it demonstrates how well prepared she was for her internship at Kimberly-Clark.

Only the scale of projects was different, she says. For example, instead of using test data in school for an application to serve 100 customers, she was contributing to applications "servicing millions of customers" during her internship (see interview below).

Computer science enrollments fell by 22% in the decade between the 1987-88 and 1997-98 school years, according to the NCES. But they're definitely on the rebound. The Computing Research Association in Washington, which conducts an annual study of enrollments at schools offering bachelor's, master's and Ph.D.'s in computer science, found that 79,311 students enrolled in computer science and computer engineering programs this year, up 17% from last year.

One school where enrollments reflect that trend is Purdue University, home of the first computer science degree program, which was established in 1962. The West Lafayette, Ind.-based school has more than doubled its number of computer science graduates in the past five years, from 80 in 1996-97 to a projected 180 this year, says Ahmed Sameh, head of the computer science department.

The increases in MIS/CIS and computer science graduates would typically be greeted as good news for the IT supply-and-demand gap. But with the economic downturn and the rise in U.S. unemployment to 4.5% in April, campus recruiting has slowed somewhat, professors say. At the University of Alabama, for example, about 10% of this year's MIS graduates were still awaiting job offers in mid-April, Hale says. "Last year, 100% of our graduates were placed by graduation; this year, I can confidently say 95% will be placed," she adds. "That's a softening for us."

Similarly, a handful of the 50 to 60 firms that regularly recruit from SMSU have told Meinert that they'll be seeking fewer graduates next fall than they have in the past.

"One has reported a hiring freeze, and a number have indicated that their high-priority projects are not at the entry level," Meinert says. Nonetheless, he says, he expects graduate placement levels this year and next to remain consistent with previous levels. For the past several years, SMSU has conducted surveys of former students 90 to 120 days after graduation. The results of the most recent survey show that 92% of the graduates from the past several years have full-time jobs, 5% are in graduate school and 3% are no longer looking or didn't respond. ▶

Goff is a freelance writer in New York.

IT's Future Is in Good Hands

Student Anna Kilinski already has a clear vision of how she wants to leave her career mark.

Q: Why did you choose an IT degree?

A: I started out as a health care management major. My brother sparked my interest in IT, and I did some research and found that even with a business degree, a computer science minor gives you a competitive edge.

So I started a computer science minor, and I realized I wanted to [pursue] the business aspects along with technology. I did some more research into what kind of growth there would be for IT, and it was very obvious that the demand would be growing well into 2010. So I switched into the MIS program at the end of my sophomore year.

I wanted something that would challenge me to constantly learn. There isn't one point in this program where you can get comfortable, because it's constantly changing. It was definitely a change of pace from other courses I had taken – from working on my own to working on team-oriented projects where your decisions rely on those of two to 15 other classmates.

Q: How well do you feel your program has prepared you for an IT career?

A: Exceptionally well. The list is endless: interpersonal skills, project management, hands-on experience, professionalism, learning to work with different people with different backgrounds and career goals. I'm working with three international students on my [senior project] team now. And I've been able to overcome communication barriers with them, for example.

The projects I've worked on have been of tremendous educational value. You have live clients with real deadlines and real funding. The program has allocated two labs for MIS students only, where we can go in and work on prototypes. We have millions of dollars worth of software at our disposal.

Also, you get the opportunity to work with AIMS. That program has allowed me, on a personal level, to develop my networking skills. You get to talk to CIOs, CFOs and HR people at Fortune 500 companies. We have them come once a week to talk about their IT projects, atmosphere, etc. We get to talk to them [on a] one-on-one level, so it opens the channel of communication [with potential employers].

Q: What impact have your internships had on you?

A: With each internship, you get to try a new industry, new technologies, a new town, a new job description. They're like little snapshots of what your career could be like. You can [assess whether] you see yourself doing this for a long time. You learn to assimilate to the corporate environment.

[At Kimberly-Clark] I was surprised to realize how much I'd actually learned in school and actually knew, once I started using my skills on the job every day. I think I knew what I was getting into, but on a different scale.

The projects I worked on were similar to things I've done in school. But instead of using test data for maybe 100 customers, they were projects servicing millions of customers. I think the internship experience will be a differentiator when I hit the job market.

Q: What do you expect from your IT career?

A: At some point, I'll have the opportunity to stay on a technical track or go more into the business and management side. I think I'd enjoy project management. I see myself more involved in the aspect of helping people apply technology solutions and helping them walk through projects. And I'm excited about the opportunities for career-long learning.

WHO SHE IS

Name: Anna Kilinski

Degree/school: Bachelor of business administration in MIS, Culverhouse College of Commerce and Business Administration at the University of Alabama in Tuscaloosa

Activities: President of the Alabama Information Management Society (AIMS), a student professional association, for the 2000-01 academic year

Internships: Kimberly-Clark in Roswell, Ga., summer 2000; Exxon Mobil in Fairfax, Va., summer 2001

Graduation date: December 2001

I definitely think IT will enable me to have more of a work-life balance. I know that some corporations are very flexible, and I will want to have a family someday. Most companies that come here talk about flexibility.

I know there will be long hours – you might be working 50 to 70 hours some weeks and 40 hours other times – but the payoff is you get more money in your bank account. And I think that, because of the demand for IT professionals, I'll get to pick and choose more. That's a great benefit of IT.

Q: What are your career goals for the next five years?

A: I don't want to set a [salary goal], because that will change. Consulting is something I find interesting, although I wouldn't do it forever because of the travel.

Eventually, within 10 years, I think I'd like to settle down with a retail business. I just want to make sure my career is limitless with advancement, that I progress not because I've been there *x* years but because I'm working hard and learning and being recognized for the contributions that I'm making.

– Leslie Jaye Goff

FINANCIAL & BUSINESS CONCEPTS IN BRIEF

Bankruptcy

BY CHRISTIE TAYLOR

BEFORE UNIFI Communications filed for Chapter 11 bankruptcy in January 1999, the account management team knew the company was in distress. Open positions at the Burlington, Mass.-based telecommunications firm weren't being filled, and Friday afternoon barbecues were a distant memory. "We're looking for another round of funding" was the oft-spoken phrase heard in the halls during the company's Chapter 11 proceedings.

Unifi's business model was centered around quick delivery of secured faxes. But when the Internet emerged, Unifi was sent packing.

"We gave as much advance notice as we knew," says Tricia Forrester, who was a human resources benefits specialist at Unifi during the bankruptcy. "We didn't know whether last-minute deals would go through, but once we knew the company had decided to dissolve, we let employees know."

Glimmer of Hope

But before employees hear the "B" word and start scrambling for the door, they should realize that facing Chapter 11 isn't the worst place to be. Unlike Chapter 7, there's some hope under Chapter 11.

If a bank, venture capital firm or other lender thinks a company has enough staying power to make an injection of money worthwhile, it provides what's known as debtor-in-possession (DIP) financing. These lenders are at the top of the list come payback time. DIP financing is what many struggling dot-coms are vying for today.

"Think of Chapter 11 as a game of tennis in which the corporation has a right to serve," says Harvard Business School professor Stuart Gilson. "In the game of bankruptcy, management gets to serve the ball until it gets it over the net.

"[U.S. bankruptcy laws] operate under the presumption that a company is worth more alive than dead and that if you can give that company some breathing room, sometimes it will turn around," Gilson adds.

In Chapter 11 proceedings, a company's management has 120 days to come up with a solution for resolving its debt. (During this time, there's often a change in management.) Creditors then have 60 days to either vote in favor of the plan or send management back to come up with a new approach.

But high-tech companies face an unpredictable set of circumstances when it comes to seeking cash injections: Their primary assets can walk right out the door.

In more traditional markets, companies filing for bankruptcy can list equipment and products as their assets. But when an idea-based outfit like a high-tech company is forced to shut its doors, payback gets a little more complicated.

"For those companies who have people with ideas, creditors seeking recovery in a typical software high-tech distress situation may find trouble creating value out of assets," says Jeff Spiers, a bankruptcy attorney at the Houston office of Andrews & Kurth LLP. "The reason being, assets are imbedded in people's brains. And indentured servitude went out with the Emancipation Proclamation."

When London-based fashion Web site Boo.com folded last summer, it faced the same problems that companies such as Santa Monica, Calif.-based DrKoop.com Inc. face right now: how to capitalize on intangible assets. Boo.com sold its software and intellectual property, but at a price greatly reduced from its development costs. Most of the information was in the brains of its software developers.

Waltham, Mass.-based Toysmart.com Inc. tried to address this problem during its liquidation last summer by attempting to sell its customer list, one of its few tangible assets. But that resulted in a battle with the Federal Trade Commission, which accused Toysmart of violating its privacy policy. In that policy, Toysmart assured customers that it wouldn't share their personal information with third parties.

"For high-tech companies, Chapter 7 is more common than Chapter 11 because your value tends to walk out the door," says Gilson. And "when that value leaves, there's less available to support reorganization," he explains.

Still Playing

Even companies that don't produce a high-tech product have to be concerned about their tech-minded employees.

In February, Loews Cineplex Entertainment Corp. in New York filed for Chapter 11 bankruptcy protection and announced it would close 23 theatres in Canada. The company had already closed 164 screens at 34 locations between March and November 1999.

However, it's still business as usual for the IT department, according to Mindy Tucker, vice president of strategic planning at Loews.

"During our Chapter 11, we continue to pay our employees and they continue to have the same benefits they've always had," she says. "The employees that are being impacted the most are those in the theaters that are closing."

Although IT employees might find comfort in the fact that their skills are in demand, morale is bound to waver as they watch co-workers get laid off. It takes faith and loyalty to continue working for a company as its stock price nose-dives — especially if employee compensation packages include stock options.

When a company is paying back its creditors during a Chapter 11 bankruptcy case, organizations that are typically paid back first include banks, other lenders and insurance companies. Those administering the bankruptcy proceedings come next, with stockholders (including employees) last in line.

Employees are given priority when it comes to wage compensation. Bankruptcy laws allot $4,300 per employee for anything earned within 90 days of a firm's bankruptcy.

Employees of companies that are facing bankruptcy also need to think about health insurance, 401(k) distributions and life insurance. "Once a company stops sponsoring [insurance plans], it usually lets employees know right away," says Unifi's Forrester. "No company wants to drop a bomb like that."

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DEFINITION

Bankruptcy affects companies that don't have the cash to pay their debts, but it doesn't have to be a kiss of death. In Chapter 7 bankruptcy, a company goes out of business, sells its assets and pays off creditors under the direction of a court-appointed trustee. In Chapter 11 bankruptcy, the company remains in operation and tries to reorganize or liquidate its assets.

[Bankruptcy laws assume] that a company is worth more alive than dead.

STUART GILSON, PROFESSOR, HARVARD BUSINESS SCHOOL

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JOE AUER/DRIVING THE DEAL

Leasing's Different When It's Laptops

LAPTOPS ARE INCREASINGLY USED in today's mobile workforce computing environment, and in corporate America, a good percentage of them are leased. Many laptop lessors start with a traditional lease originally drafted for mainframe leasing and try to make it work for laptops. But watch out!

There are 10 traditional leasing provisions that should be treated differently with laptops. Neglecting to make these changes can make it difficult to live up to the letter of a laptop lease and can even technically place you in default of a leasing agreement. To avoid ugly complications, ask your lessor for contract changes regarding the following topics:

■ **Relocation without approval.** Laptops can move around an organization and the world, so it's essential to get rid of the lessor's right to approve a location change.

■ **Equipment tagging.** Lessors want you to tag the equipment with their ownership labels and usually provide the tags after the equipment has been distributed. But it's an enormous effort to send the tags to all of the equipment users, ask them to affix the tag and verify that the task has been accomplished. Don't agree to it.

■ **Lessor inspections.** Inspections are an administrative nightmare. Your lease was based more on your creditworthiness than on the equipment's value. Inspecting a mainframe in a glass house is one thing; inspecting hundreds of laptops is unrealistic. Don't do it.

■ **Defining "acceptance."** Laptops generally require some initial configuration and inspection work, which may be outsourced or performed in-house. Nevertheless, acceptance, or lease commencement, should begin only after configuration, not when the laptop is shipped.

■ **Risk of loss.** Decide who bears what risk and when. It's more complex than the mainframe deal, where the manufacturer (or lessor) ships and you receive. Here, there could be two risks. Risk No. 1 occurs when the equipment is shipped by the provider to the configurator. Risk No. 2 occurs when the configurator ships the equipment to your users. If the lessor uses a configurator, get the lessor to bear the first risk and the configurator to bear the second.

■ **Taxes.** Laptops are considered personal property and are therefore taxable by your state and possibly your local government. The lessor, as the owner, pays the taxes, and you reimburse him (it's called a net lease). Make sure you get copies of the tax bills and verify that they're correct. The other tax issue is location; the location of record should be where the laptops are used most.

■ **Replacement in kind.** Laptops get lost and damaged. Having to return a machine with the same serial number (as many leases require) isn't practical because of the potential of loss.

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Moreover, when you send a laptop off to a central repair facility, you may not even get the same machine back. Secure the right to give the lessor a laptop of the same make and a comparable model with a similar configuration, without being tied down to the same serial number. If you don't have this right, you may wind up eating an expensive loss.

■ **Software.** All laptops come with the operating system and desktop applications preloaded by the manufacturer. If the lease cost includes the software, make sure you have the right to use it beyond the end of the lease.

■ **Cleaning the hard drive.** You may place additional software on the laptop's hard drive and thus leave a lot of your firm's information there. Get a warranty from the lessor that it will clean the hard drive when you return the equipment. You should perform this function yourself, but logistics sometimes make it difficult.

■ **Upgrades, trade-ins and other options.** Because of a laptop's usage characteristics and short life, it's unrealistic that a lease will run to the end of its term.

Therefore, adequate provisions must be negotiated to trade in or upgrade the equipment during the term. Evaluate your needs and negotiate for flexibility. Having to buy out the lease or pay early termination charges can be costly.

We've all discovered that the laptop world is different. Now we must ensure that our lease deals reflect the realities of laptop life. ◗

BRIEFS

Airline to Offer Wireless Ticketing

JetBlue Airways Corp. announced that it will allow passengers flying out of John F. Kennedy International Airport in New York to check in, get boarding passes and check luggage from anywhere inside or outside the terminal.

The New Gardens, N.Y.-based discount airline isn't the first to offer a wireless check-in option for travelers, but it claims to be the first to have an army of roving ticket agents with portable equipment who will check passengers in, print boarding passes and check luggage. The airline said it plans to roll out the service to all of its other city operations soon.

Intel Helps Resellers Customize Sites

Intel Corp. last week announced the launch of its Server Design Center, a new online resource designed to help thousands of resellers configure customized servers for small and medium-size business customers. Resellers can go to the center and answer a series of questions about their needs, such as how many users they want their server to support and how much redundancy it needs. The Web site then provides a "recipe" for building that server, including information such as what type of processors and I/O to use and how much memory to include.

VPN Market to Grow

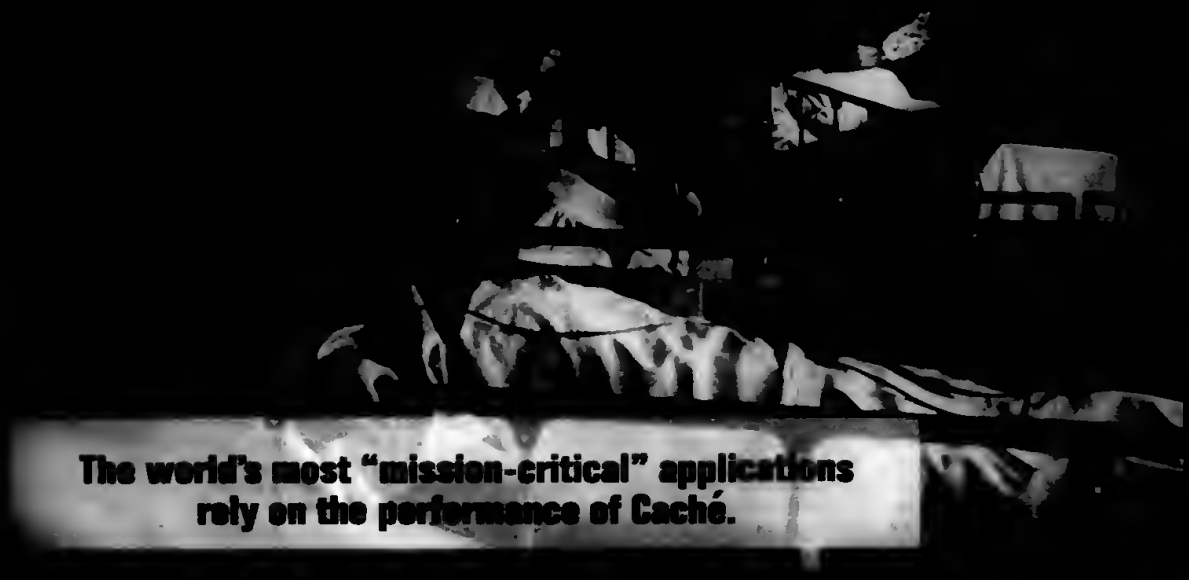
The market for virtual private networks (VPN) is expected to grow from $2.53 billion this year to $7.2 billion by 2003, according to The Insight Research Corp., a telecommunications market analysis firm in Parsippany, N.J. The growth of VPNs, which are private networks that securely transmit data via the Internet and managed networks, will likely be fueled by a combination of greater dedicated broadband access and corporate reliance on network outsourcing, according to Insight Research President Robert Rosenberg.

Cruise Workers Get Wireless Access

Employees on board the cruise ship *Radiance of the Seas* will get wireless access to e-mail, the Internet and corporate applications based on IBM's NetVista Internet Appliance, according to Miami-based Royal Caribbean Cruises Ltd., which owns the ship. Last week, the company announced that 500 devices will be installed in the *Radiance* and that two other ships will be similarly outfitted in the coming year.

IT Spending Slows

One-third of CEOs have cut back on IT projects during the current economic downturn, according to a recent survey from The Business Council, a Washington-based association of CEOs from major U.S. corporations. Only 10% of the companies surveyed said they are increasing their technology investments. The CEOs overwhelmingly said they have been pleased with the results of previous IT projects, which have proved worthy of the investment.



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TECHNOLOGY

FLAT-PANEL PROGRESS

By replacing a velvet-covered rubber roller with an ion gun, IBM researchers have found a better and cheaper way to manufacture LCDs for computers. ▸ 52

SECURITY JOURNAL

An intrusion-detection system that doesn't keep up with network traffic won't do its job. Security manager Mathias Thurman reveals the techniques be uses to determine if such a system will perform as advertised. ▸ 54

FUTURE WATCH

AT&T's research laboratory in England is working on an ultrasound tracking system that can locate a person with a wearable device and then create a virtual picture of his environment. The system could help workers on the move, but it raises serious privacy issues. ▸ 56

EMERGING COMPANIES

KVS's Enterprise Vault automates the archiving and retrieval of Microsoft Exchange Server e-mail messages to keep user mailboxes trim and server performance high. However, users say they're using the product mainly for its archiving capabilities. ▸ 60

KEN MANN of Shell Services International says that although the company has hit "some bumps in the road," most will be fixed when its card-management system is deployed.

PAM FRANCIS

ARE SMART CARDS A SMART DECISION?

SMART CARDS PROMISE to ease security administration, increase security through better authentication and enable single sign-on for network resources. They should also take some pressure off help desks, since 30% of calls received are regarding forgotten passwords. But smart cards can add complexity to the IT infrastructure. Although the setup issues are getting easier, users who have been down this road say tough integration and management issues remain.

58

BRIEFS

Forecast: 3G Wireless Use Isn't Imminent

In its annual "Technology Forecast," PricewaterhouseCoopers said near-term interest by businesses in third-generation (3G) wireless networks will be minimal for the next few years. Instead, the New York-based consultancy said 2.5G wireless networks using General Packet Radio Service (GPRS) as an upgrade to existing Global System for Mobile Communications networks will be in vogue. GPRS offers an always-on, packet-based network and provides a realistic bridge to 3G networks.

Norfolk Southern Rolls Out Bill-of-Lading App

Norfolk Southern Corp. said it has launched an Internet-based system that lets customers electronically create bills of lading for new shipments. The bill-of-lading application, which is part of the Norfolk, Va.-based transport firm's Thoroughbred Information System suite of Web-based e-commerce applications, gives customers an estimated rate immediately after they request a shipment. The system creates an electronic waybill based on historical data stored in Norfolk Southern's mainframe. It minimizes customer data entry and reduces the effort required to ensure timely and accurate shipping information.

Borland Readies Java Development Tools

Borland Software Corp. in Scotts Valley, Calif., last week announced that its JBuilder 5.0 will be available next month. This latest version of the company's Java 2 Enterprise Edition-compliant development environment includes support for XML, integration with Borland's App Server and application servers from IBM and San Jose-based BEA Systems Inc., and support for code management tools from Microsoft Corp. and Cupertino, Calif.-based Rational Software Corp., according to Borland.

Process Improves Flat-Panel Displays

IBM innovation could revolutionize industry with cheaper, better LCDs

BY RUSSELL KAY

At one critical stage in manufacturing LCDs for laptop or desktop computer use, the plates need to be rubbed back and forth with a velvet-covered rubber roller. Though scientists have studied this curious process since its development in 1906, they still haven't figured out for sure just what it does or how it works.

Now they can stop trying. IBM scientists have developed a new process that speeds up manufacturing while significantly reducing the reject rate. This new technique could revolutionize the $20 billion flat-panel display industry, potentially saving makers and consumers millions of dollars.

New vs. Old

To work properly, the rod-shaped liquid crystal molecules in a display must be properly lined up, end to end. An electrical signal is then applied, and the molecules twist and rotate, turning pixels on and off. But if the liquid crystal molecules aren't aligned properly, the resulting display won't work.

In the existing process, a glass plate is coated with a polymer substrate, and theo the entire surface is rubbed by a velvet cloth, usually covering a rubber roller. The plates are then washed and baked to eliminate contaminants. Next, the liquid crystal molecules are placed onto the substrate, where they line up precisely along the rubbing direction.

Until now, the only way to reliably align the molecules was that 95-year-old process. The system works fairly well, but it's inefficient for several reasons. First, it introduces debris that could contaminate the process, so rubbing and subsequent cleanup must be done outside the clean-room environment where the rest of the manufacturing occurs.

Second, the velvet can create streaks and scratches that will be noticeable in high-resolution displays. This is particularly troublesome in that a rubbing-caused defect likely won't be caught uotil later in the process, after bundreds of defective panels have been made that must be discarded.

Third, the rubbing can produce electrostatic discharges that can damage delicate electronic circuitry just below the rubbed film.

Also, the velvet cloths wear quickly and must be replaced every shift, stopping the manufacturing process. Finally, since the nature of the current process isn't well understood, it has been difficult to improve on it or to solve problems.

"Replacing the rubbing process with a simple noncontact method has been one of the most significant roadblocks in display manufacturing," said Praveen Chaudhari, lead researcher on the IBM project and winner of the 1995 National Medal of Technology. "When we successfully integrate this process into manufacturing, it will enable new generations of displays that are higher quality and lower cost."

> When we successfully integrate this process into manufacturing, it will enable new generations of displays that are higher quality and lower cost.
>
> PRAVEER CHAUDHARI, LEAD RESEARCHER OR IBM PROJECT

In the May 3 issue of the scientific journal *Noture*, Chaudhari and his colleagues described a new method that uses a low-energy beam of ions to align the liquid crystal molecules without the need for physical contact.

The first part of IBM's new method is to abandon the polymer io favor of a substance called diamondlike carbon, which is widely used as the final hard layer on magnetic disk platters. An ion gun is aimed at the carbon layer at an angle, and its beam selectively pushes away groups of carbon atoms on the surface that aren't oriented parallel to the beam. Left behind are atomic-scale rows. When the liquid crystal material is added, one end of each molecule attaches to an exposed carbon atom, and they all line up in the direction of the rows.

IBM's new process has significant advantages over the old method.

First, it takes less time and produces less streaking, increases yield and reduces waste. The display surfaces are automatically — and atomically — smoother than is possible by rubbing. The technique is built right into the manufacturing line inside the clean room, eliminating a number of steps and interruptions.

Not using the polymer film also avoids the need for organic solvents and their disposal. Finally, besides the manufacturing efficiencies, preliminary tests of displays made through the new process point to somewhat better image quality, including a reduction in "ghosting," or image persistence.

IBM is considering converting a pilot line used to build displays with this technique into a full-blown production line by year's end. An IBM spokesman said the company is open to licensing the process to other display manufacturers. He added that last year, IBM earned more than $1.7 billion in revenue from intellectual property licensing.

At the annual meeting of the Society of Information Display, which will be held June 3-8 in San Jose, IBM will demonstrate a prototype display made with the new ion-beam process.

IBM WILL USE ITS NEW display manufacturing technique to build the world's highest-resolution display. Code-named Bertha, IBM's display has more than 9 million pixels on its 22-in. screen and is 4.5 times crisper than the top-of-the-line HDTV sets.

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Intrusion-Detection Systems by the Numbers

Well-designed IDS performance tests help security manager separate product hype from reality

BY MATHIAS THURMAN

WHEN YOU BUY a sports car, it's a no-brainer that you'll take it for a test drive to make sure you like the way it handles, the comfort level and its performance. And if you're like me, when purchasing a security product for your company, you show the same due diligence to make sure you're getting the performance you need.

SECURITY MANAGER'S JOURNAL

My company recently tested and acquired a network-based intrusion-detection system (IDS). Over the past few months, I've received many e-mails from readers asking me to explain the performance-testing methodology I used, so I've decided to share how I tested our network-based IDS. (A network-based IDS server watches traffic destined for all host systems on a subnet, while a host-based IDS typically runs on each host system to be protected.)

Performance is only one possible criterion for choosing an IDS. Depending on the level of expertise of you and your staff and the amount of resources available, your requirements and testing criteria may be different from mine. You might focus on ease of use and strong reporting, ease of creating new attack signatures or price.

Performance is critical to me because of the high amount of bandwidth our site must sustain. I can't afford to miss any potential events because of the performance limitations of the IDS infrastructure.

My definition of IDS performance is the ability for an IDS infrastructure to consistently detect *x* number of attacks within a given bandwidth utilization. The key word here is *consistent*. Words like *usually*, *sometimes*, *typically* and *on average* don't work for me. I have to know that at 3 a.m., while I'm tucked away in bed, my IDS is consistently analyzing every packet for signs of an attack.

Most IDSs look at each IP packet and determine whether it's part of an attack. IDS software can take many approaches to accomplish this, just as home burglar alarms have many ways to detect when someone has broken into your home. But I won't go into IDS software technology here.

The issue with performance is that with high levels of bandwidth, I want my IDS to continually and consistently look at every IP packet and respond accordingly. In my environment, I have no tolerance for an IDS missing, or dropping, packets that could be part of an attack.

To set up my tests, I started with a closed (not connected to the Internet), controlled environment in which to configure my IDS. After the configuration was complete, I launched a predictable attack against a specific resource on the network while injecting increasing amounts of network traffic.

If you do this, at some point, the IDS will no longer be able to effectively and consistently detect the attacks. And that limit, measured in megabits per second, is what interests me. There are many ways to set up this test, but the basic elements consist of an attack generator, a victim system, a packet/traffic generator and the IDS to be tested.

I don't have room to go into the configuration details, but here's how I set up the testing. To start, I needed to have a consistent stimulus for the test to be effective and defendable, so I could use the results for purposes of resource allocation, justification and other budgetary requests.

There are a few things to consider when setting up a test. First, your network traffic generator should be configured to generate a mix of traffic comparable to your network's general level of activity. I used a combination of HTTP, Telnet and Internet Control Message Protocol packets. The best way to do this is to take a sample of your network traffic and configure your packet generator accordingly.

The next issue is generating the attacks. I picked eight different attacks and scripted them so that when I typed "go 10.34.45.128," my system would launch the attacks against the IP address submitted at the command line.

I built a Linux system just for this purpose. When choosing the attacks, make sure you pick several types, as I did. (Choosing eight port scans or denial-of-service attacks doesn't make for a legitimate testing environment.) I then configured a Solaris Web server with an IP address of 10.34.45.128 as my victim.

For the IDS setup, I chose a policy that's similar to the configuration I use in my production environment. If I had configured the IDS to watch only for the eight attacks I scripted, it wouldn't have been a fair test. I started with no network traffic and launched the attacks against the victim system. That was the litmus test, and any good IDS should be able to detect such attacks. I did this three times as a baseline.

Then I increased the network traffic in 3M to 5M bit/sec. increments and repeated the test, launching each attack three times at each traffic level. I did this until the IDS was no longer consistently responding to the attacks. It was that simple.

If your testing is successful, you should be able to determine at what level your IDS will start dropping packets. In my test case, I was looking for performance in excess of 15M bit/sec., as that seems to be my company's average aggregate bandwidth.

We are using RealSecure from Atlanta-based Internet Security Systems Inc. We based our selection on performance, previous experience and the need to get a system up and running very quickly. Another surprisingly well-performing IDS is Dragon Sensor by Rochester, N.H.-based Enterasys Networks Inc.

With the information you collect from your IDS testing, you can also decide how you want to design your IDS infrastructure. To overcome IDS bandwidth limitations, there are ways to implement load balancing or segregation of your network to make the best use of the discovered IDS limitations.

At the end of the day, you want to ensure that when something goes bump in the night, your IDS will respond accordingly. ■

THIS WEEK'S GLOSSARY

www.shomiti.com: The Packet Blaster Plug-in from San Jose-based Shomiti Systems Inc. is an easy-to-use, configurable packet generator. I used it for my testing.

www.netcomsystems.com: SmartBits from Calabasas, Calif.-based Spirent Communications is another good tool to consider if you need a packet generator.

www.sans.org/newlook/resources/IDFAQ/ID_FAQ.htm: If you're in the market for an IDS, I recommend a visit to the list of frequently asked questions about intrusion detection at Bethesda, Md.-based SANS Institute's Web site.

SECURITY BOOKSHELF

Hacking Linux Exposed: Linux Security Secrets & Solutions, by Brian Hatch, James Lee and George Kurtz (McGraw-Hill, 2001). I read security books as reference materials, and this book is an awesome reference. Although the authors' primary focus is Linux, many of the terms, techniques, tools and discussions apply across all aspects of information security.

MORE ONLINE For more on the Security Manager's Journal, including past journals, visit www.computerworld.com/securitymanager.

■ This week's journal is written by a real security manager, "Mathias Thurman," whose name and employer have been disguised for obvious reasons. It's posted weekly at *www.computerworld.com* to help you and our security manager better solve security problems. Contact him at mthurman@hushmail.com or head to the Security Manager's Journal interactive forum.

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YOU NEED A DIFFERENT KIND OF SOFTWARE.

Tracking Your Every Move

A new ultrasound device pinpoints the wearer's location within inches. By Jennifer DiSabatino

A TECHNOLOGY that gives doctors easy access to patieot information and can quickly locate a specific specialist in an emergency would clearly be beneficial. On the other hand, such a technology could also let colleagues know how long a co-worker lingers at a water cooler or vending machine. A new ultrasound tracking system will make both scenarios possible, highlighting how deeply questions of privacy are embedded in emerging technology.

AT&T Corp.'s research laboratory in Cambridge, England, is working oo a new ultrasound system that will be able to locate a persoo wearing a small tracking device within inches and then create a virtual picture of his environment.

The device, called Active Bat, works by sending sound waves that are picked up by three or more nodes in a grid of receivers placed throughout a building, usually above the ceiling tiles. The receivers measure the speed of the sound waves from the Active Bat. The system then calculates the distance from the wearer to the receiver and can depict the wearer in a 3-D picture of his environment.

While there are clearly some privacy issues to be addressed, the new technology is primarily being developed as a way to create a fluid workspace in which the system knows where a user is and logs him into the nearest computer terminal with his personal profile.

Active Badge, the predecessor to Active Bat, worked on much the same principle. However, it used an infrared signal and could pinpoint the device only to within a few feet.

"With 50 PCs in the same room, [with Active Badge] it was actually impossible for the computer to know which one you're standing in front of. That is not good enough," said Andy Ward, one of the Active Bat researchers.

Ward and his colleagues at the Camhridge labs, formerly known as the Olivetti Research Labs, are looking for a way to allow doctors, for example, to be ahle to immediately access patient information from the network as they move through a hospital.

Active Bat's technology and its support for this form of uhiquitous computing has potentially widespread applications in various kinds of workplaces, according to researchers at AT&T. Companies could use the device in lieu of password log-ins.

Each Active Bat transmitter uses 48-bit encryptioo for the user's identification and would be more secure thao a password. Of course, the transmitters could be easily lost or stolen, Ward noted, and might be used in conjunction with a fingerprint or other hiometric scanner installed in the wearable device.

Cost is a factor in the development of ultrasound tracking technology, according to the researchers. Providing employees with wireless, handheld devices that can access network data — another approach to getting information to mobile workers — requires a substantial investment in both handheld computers and wireless infrastructure.

The Active Bat system would require a smaller, hut still significant, infrastructure investment. AT&T's research lab estimates that the transmitters will cost about $1. Currently, Active Bat receivers must be placed every 1.2 meters or so to work, which is roughly every third or fourth ceiling tile. Ward said he's working on reducing the number of receivers needed, which would lower costs.

There's also the possibility that Active Bat could be used as an assistive technology, to provide a "picture" of their environments to people who can't see. Scientists are in the exploratory stages of a technology that would turn ultrasound images — created, for example, by Active Bat — into a sort of braille image for the user to "see" with his hand.

"We've talked to people who are interested in [assistive technology]," Ward said. "But it's probably going to be several years before this is commonplace. It's still kind of on the whacky end of what's possible."

Ward said the ultrasound emissions are within guidelines set hy international health bodies, and those standards have been tested for 20 years with no evidence of ill effects on humans.

Of course, there are potential drawbacks to Active Bat, such as the effects on personal privacy.

Ward said he would prefer that Active Bat not be used to monitor employees, adding that the technology was designed to give users quick access to computer oetworks.

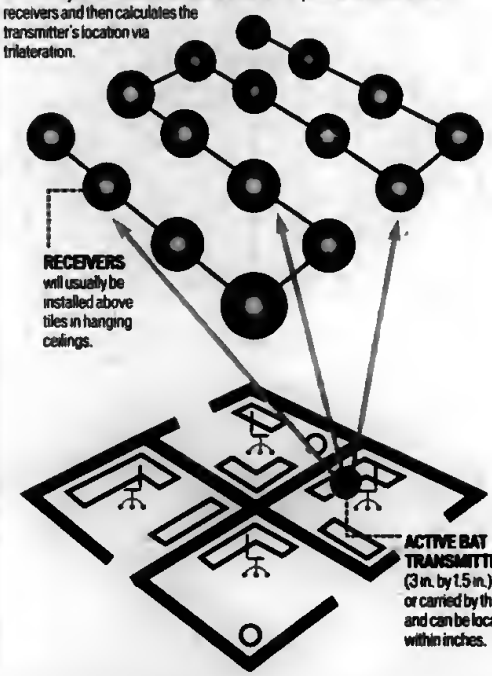
"When we developed the technology, we realized that there are implications for privacy," he said.

Ward added that AT&T researchers were convinced that Active Bat's potential benefits outweighed those concerns.

"We shouldn't be doing this [if] it would only be used for the boss watching where you are," he said.

Ultrasound Location System

A short pulse of ultrasound is emitted from a transmitter (an Active Bat) worn by the user. The system measures the time it takes for the pulse to reach three of the receivers and then calculates the transmitter's location via trilateration.



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SMART CARDS, SMART MOVE?

Smart cards promise to ease administrative headaches and improve network security — but they also add complexity to the IT infrastructure. By Kim Gilhooly

FUELED BY A NEED TO REDUCE the total cost of ownership for its desktops, Royal Dutch/Shell Group is rebuilding its worldwide infrastructure around Windows 2000. By exploiting Windows 2000 Server's native public-key infrastructure (PKI) and smart-card support, the Hague-based oil and gas company expects to significantly reduce help desk support costs, increase security and, ultimately, provide users with a single sign-on to all network assets.

"We've been looking for ways to unify our [security processes] worldwide. When Microsoft built PKI and smart-card support into Windows 2000, we decided to take advantage of that," says Ken Mann, project manager for the security initiative that's under way at Shell Services International Inc., the company's Houston-based IT arm. Currently in production with 7,000 users, the system is slated to serve 85,000 users at 1,200 sites in 134 countries by year's end.

Shell is just one of many large firms looking to reduce support costs and bolster security by arming employees with smart cards for network access. When used as part of an infrastructure that incorporates public-key cryptography, smart cards can provide tamper-resistant storage for network passwords, private keys and other personal information. Companies can use PKI and smart cards to authenticate users requesting network access and to achieve nonrepudiation (the ability to prove that a person took a particular action).

Because smart cards store the passwords needed to access various corporate applications, the help desk doesn't have to field calls regarding forgotten passwords. That's no small advantage: According to industry estimates, up to 30% of support calls are about lost passwords, and manual password resets cost between $15 and $30 per call.

Further, by giving users a smart card and a personal identification number (PIN), organizations can achieve two-factor authentication, which provides security by granting network access only to people who can prove they're authorized by showing something they have (the smart card) and something they know (their PIN).

Companies are also increasing security by tying network access to physical access, all on one smart card.

This could ease the burden on users as well, because smart cards — with their stored private keys, passwords and digital credentials — can help corporations create single sign-on (SSO) access for all network resources.

New Savings, Costs

However, building an access model around smart cards and PKI can be challenging. While a smart-card system reduces support costs, it creates others: Companies must purchase the cards, as well as readers or card-ready computers, at costs varying from less than $100 to several hundred dollars per user. Businesses need a card management system to issue and revoke cards. If enterprises are going to issue digital certificates, they must establish a system to do so or use a third-party certificate authority. And they face complex integration issues as they migrate applications to PKI to allow access to network assets via SSO.

Detractors say putting passwords on one card and creating an SSO model risks giving away the keys to the kingdom, should the card be compromised. But the potential benefits and market drivers such as new privacy legislation have many large firms considering PKI and SSO initiatives.

The difficulties associated with bringing together PKI and smart cards for network access means many firms will turn to Microsoft Corp., say ana-

lysts. SSO integration problems can be minimized by the homogeneity that Microsoft brings to the enterprise.

"Single sign-on is extremely difficult to do, even in a pure Microsoft environment. Without that, it's virtually impossible," says Cate Quirk, an analyst at AMR Research Inc. in Boston.

Windows 2000 provides for integrated SSO capability by means of the Kerberos authentication protocol, according to Mike Dusche, a Microsoft product manager.

That appeals to Royal Dutch Shell. "Certainly, Microsoft isn't best-of-breed, and they've had problems with their first release of PKI [support]," says Mann. "But they are bringing it all together in one place, so we can live with the shortcomings and the knowledge that it will improve with future releases. If we went with trusted third parties for all our users and PKI, the costs would be much higher." He adds that large organizations deploying a system like Shell's, which includes readers, multifunction smart cards and card management software, can expect to get costs down to $30 to $40 per user.

Mann says that although Shell has hit "some bumps in the road" at this early stage, most will be alleviated when the company deploys its card management system. He says users generally like having one card for network logon, building access and cafeteria billing.

Several factors drove London-based British Telecommunications PLC (BT) to deploy a PKI-supported smart-card system, including the fact that it has 60,000 employees who need remote access. Though BT's dial-up approach is generally sufficient, it experienced scalability difficulties whenever the ranks of remote workers swelled.

"We wanted to make access more ubiquitous," says Steve Brown, head of business development and utility applications at BT's Ignite communications services unit. "We decided to use digital certificates stored on smart cards, with Microsoft as the platform, and employ IPSec for encryption." The firm previously used Bedford, Mass.-based RSA Security Inc.'s SecurID token for remote access. Brown says that although that approach served the company well, users had to remember passwords, and the system didn't provide the encryption levels that BT desired.

"Our system required changing passwords every 30 days. People inevitably forget passwords, and turning to the help desk is an expensive hobby. We're trying to get away from those operational expenses," says Brown.

The company is piloting smart-card-based access for about 200 workers and plans to eventually roll out the system to 60,000 of its 130,000 employees. Brown says that SSO is a goal at BT, but progress will come in stages. "You have to bite off sensible chunks. We're saying, 'Let's get the infrastructure and the access mechanisms there and determine the priority sign-ons before we move forward.' "

Indeed, SSO doesn't come easily, and some doubt it will come at all.

"SSO became a big deal four or five years ago, when users had a lot of operating system and application accounts, but it never really worked that well," says John Pescatore, an analyst at Stamford, Conn.-based Gartner Inc. "Now the issue is access to Web-based accounts. Rather than worrying about users doing SSO, companies need to worry about how they can administer user privileges centrally."

Sue Pontius, CEO of San Jose-based smart-card system vendor Spyrus Inc., says SSO is more of a goal than a reality. "Single sign-on doesn't really exist; reduced sign-on is the more appropriate term," she says. "Your goal is to raise the bar by making it easier for authorized users to access accounts and more difficult for everyone else."

Gilhooly is a freelance writer in Falmouth, Maine.

Smart Cards at a Glance

PROS

- Two-factor authentication enhances security.
- Help desk calls for lost passwords are reduced.
- Smart cards integrate with PKI for password encryption.
- They support single sign-on access.
- Setup is made less complex by smart card, Kerberos SSO and PKI support in Windows 2000.

CONS

- Integration issues with PKI and SSO are still complex.
- Card-reader hardware and card management systems can cost $100 or more per workstation.
- Lost cards can create security risks.

KEN MANN, project manager at Shell Services International, says Windows 2000's native support for PKI and smart cards like these can help the firm reduce costs and boost security.

MOREONLINE

For more information about smart cards, visit our Web site.
www.computerworld.com/tcards

Enterprise Vault Eases E-Mail Admin Woes

KVS's tool helps keep Exchange message stores lean and archived mail accessible

BY ROBERT L. SCHEIER

SOMETIMES IT'S the mundane problems that waste the most time.

Consider e-mail. When Microsoft Exchange message stores grow too large, they degrade the performance of Exchange servers. To prevent the uncontrolled growth of users' mailbox content, some administrators set quotas that shut down a user's e-mail if his mailbox grows too large. But users get grumpy when faced with the loss of their e-mail, and administrators must either force users to delete old messages or manually reset their e-mail quotas. And if a user accidentally deletes a vital message, searching for it in old backup files can take hours.

New York-based KVS PLC claims to have a better way, with Enterprise Vault for Microsoft Exchange. The company's information archiving and retrieval tool automatically moves e-mail messages further into a company's storage environment as those messages age and indexes them so they can be retrieved for regulatory, legal or other purposes.

"They address two key business needs for Exchange users," says analyst Mark Levitt at IDC, a Framingham, Mass.-based market research firm. "One is the need to offload storage from both local and primary servers to backup servers and archival servers." Those backup and archival servers are less expensive than primary servers, says Levitt, and moving older e-mail to them helps keep primary e-mail servers running at peak performance.

The second need is disaster recovery, since having an easily searchable archive of e-mail helps companies recover from the failure of a primary Exchange server.

"What Exchange is good at is the dynamic, minute-to-minute information," says Nigel Dutt, co-founder and chief technology officer at KVS. "What we're good at is the big-bulk, long-term, high-volume storage."

Enterprise Vault was first developed by Digital Equipment Corp. but was acquired by KVS after Compaq Computer Corp.'s acquisition of Digital. It runs on a dedicated Windows NT or 2000 server and supports multiple Exchange servers, automatically moving aging e-mail from users' mailboxes to the Enterprise Vault store. From there, e-mail can either be deleted or moved to secondary or tertiary storage.

Microsoft Exchange allows users to store old messages in personal information store (PST) files. But Dutt claims that Enterprise Vault is superior to using PST files because such files can't exceed 2GB and can be accessed only by users.

Off-line But Accessible

Since March, the Alberta Department of Energy in Canada has been using Enterprise Vault to archive 80GB of Exchange 5.5 data, says network analyst Judy Glazier. Beyond the advantage of not having to back up PST files, she says, her 1,000 users can search Enterprise Vault themselves for missing messages or file attachments.

Glazier says she's been pleased with the performance and ease of use but recommends having KVS do the installation and configuration. Enterprise Vault "isn't a very easy product to install and set up," she says.

Jackson National Life Insurance Co. in Lansing, Mich., considered using Enterprise Vault but was initially reluctant to buy from a small start-up, says director of network services Brian Gunnell. This spring, however, the insurer purchased Enterprise Vault for some users, and Gunnell says the product has been "very easy to manage, very easy to administer." He says the company plans to deploy it enterprisewide this summer.

KVS pitches Enterprise Vault as a knowledge management tool that could help mine Exchange e-mail for vital information. Users and analysts say that's a future concern, and they're more impressed with Enterprise Vault for its ability to solve common e-mail management problems today. ▶

Scheier is a freelance writer in Boylston, Mass.

"WHAT WE'RE GOOD AT is the big-bulk, long-term, high-volume storage," says KVS co-founder and CTO Nigel Dutt.

KVS PLC

230 Park Ave., Suite 1000
New York, N.Y. 10169
(877) 358-2858

Web: *www.kvsinc.com*

Niche: Microsoft Exchange archival storage and knowledge management

Why it's worth watching: It boasts strong capabilities for easing administration of Microsoft Exchange in large companies or those with regulatory or legal requirements for tracking e-mail.

Company officers:
- Geoffrey Chamberlain, chairman
- Mike Hedger, CEO
- Nigel Dutt, chief technology officer and co-founder

Milestones:
- December 1999: KVS founded; acquires rights to sell Enterprise Vault
- July 2000: Firm raises $8 million in second round of funding

Employees: 50

Burn money: $9 million from Durlacher Corp. and Cazenove Private Equity

Products/pricing: Enterprise Vault for Microsoft Exchange costs $3,000 per server, plus $15 to $50 per user (based on the size of implementation) and an 18% annual software maintenance fee.

Customers: Donaldson, Lufkin & Jenrette; Jackson National Life Insurance; Alberta Department of Energy and others

Red flags for IT:
- KVS bills Enterprise Vault as a knowledge management tool, but most customers use it only for archiving Exchange e-mail traffic.
- The product can be complicated to set up and configure.

COMPUTERWORLD emerging companies

[the buzz STATE OF THE MARKET]

Managing the Exchange Store

With 50 million to 60 million Microsoft Exchange users worldwide, there's built-in demand for any tool that can make an e-mail administrator's life easier. Within that user base, between 30% and 60% have enough of a need and the ability to pay for an archiving tool such as KVS's Enterprise Vault, says Tom Grace, research director at research firm Open Systems Advisor Inc. in Boston.

The sweet spot for KVS, says Grace, will be companies that are large enough to face e-mail storage challenges or companies of any size that have a legal or regulatory requirement to store, track and retrieve e-mail.

KVS claims that Enterprise Vault could be used to sort through e-mail messages, attachments and other files to create knowledge management applications. But Grace says KVS "is really part of the puzzle, not the complete solution" for such efforts. Current competitors include the following:

Veritas Software Corp.

Mountain View, Calif.
www.veritas.com

Veritas' NetBackup for Microsoft Exchange Server supports automatic, unattended backup for local or remote Exchange clients, as well as the ability to restore individual mailboxes, folders and messages. It offers backup and restore capabilities but not message searches.

Ixos Software AG

Munich, Germany
www.ixos.com

Ixos-ExchangeArchive allows the automatic archiving of complete e-mail messages or just attachments in a secure repository, as well as transparent user access to archived items from users' Exchange e-mail folders. Archival messages aren't searchable, however.

OTG Software Inc.

Bethesda, Md.
www.otg.com

OTG's EmailXtender automatically stores and archives e-mail and attachments into its Enterprise Message Center, with full-text indexing and searching of messages and attachments.

– Robert L. Scheier

This June, the leading companies and conferences in technology take center stage in New York City.

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High Hopes, Harsh Reality

Dizzy with images of dollar signs in their heads, IT job candidates are finding the financial services industry to be much less generous than they expected and employers a lot fussier about what they'll shell out cash for. By Erik Sherman

JOHN KIVEL says many applicants for IT positions at his firm have unrealistic expectations of the kinds of salaries the current market will bear.

JOHN KIVEL is tired of candidates with unrealistic expectations seeking IT jobs in financial services.

"People still have that taste in their mouth from last year, when companies were salivating from the sight of your [networking] certification or one to two years' experience," says Kivel, recruiting manager at Boston-based WorldStreet Corp., which makes systems that match securities buyers and sellers.

"A lot of these people went to corporations and were paid $65,000 to $70,000 for one year of experience," Kivel says. "Now they're jobless. They've set their bar at that level and think they deserve another bump when they come to us, when reality is, they're probably a $55,000- to $60,000-a-year candidate."

The softening of the economy has brought big changes to the financial services industry. The freewheeling days of the past couple of years are over. Companies that are still hiring are strategically filling key technical positions.

Companies are also choosier about who they bring on board. Then there are those firms that are cutting back on projects.

"Financial services were on the forefront of adopting new technology and e-commerce," says John Barrett, an executive director at Russell Reynolds Associates Inc., an executive placement firm in New York. "What we are seeing is a major retrenchment. Companies are either shutting down [online divisions] entirely or saving certain aspects, like the technology, and embedding that back into the existing organization."

Not all recruiters agree with Barrett. "A lot of recruiters [in financial services] only see what hits their desk, and they define the industry as what hits their desk. That's not reality," says Patrick Sylvester, managing director at Philadelphia-based recruiting firm Banister International. "[Many financial services firms] had so many openings going into this scenario, they still have open [requisitions]."

MOREONLINE

To learn more about the qualities IT managers look for in job candidates in today's changing market, visit our Web site www.computerworld.com/linjobs

Much of the hiring is happening directly, without the use of recruitment firms. For would-be employees, that means focusing on contacting companies directly through Web sites or, better yet, getting referrals from current employees.

At Merrill Lynch & Co. in New York, the changing economic climate is causing the company to re-examine a rush of projects from the past couple of years and to focus more heavily on business priorities.

"There is more careful scrutiny, due to market conditions, on our IT spending," says Ken Brzozowski, a vice president in the technology unit of Merrill Lynch's corporate and institutional client group. "We're not necessarily canceling all projects. We're slowing down and delaying some that may not be critical."

Job candidates should also expect salaries that have deflated from the highs of last year, when traditional financial services firms were worried about losing people to Internet start-ups.

"People were getting greedy last year," notes Michelle Patterson, president of X-cavate Research LLP, a Houston-based human resources research firm. "You can't get as greedy as you were last year."

For example, C and C++ programmers can expect $60,000 to $80,000 per year, depending on geography and experience.

A tighter market doesn't mean that someone without financial services experience is left out. Kivel says he's looking for candidates with a financial services and investment technology background, but he finds such people only 10% to 15% of the time.

For job hunters who aren't at the top of their game, Jan Lee, CEO of Breck Technology Services Inc., has some advice. "Increase your skill set where you are, bring value to your current position, then, when things settle down, move on," says Lee. Breck Technology is a Charlotte, N.C.-based human resources consulting firm.

"Start planning on your exit," Lee suggests. "Look at new technology, get training in that area, and look at companies you might want to work for."

Sherman is a freelance writer in Marshfield, Mass.

The Market At a Glance

Financial services companies are involved with the movement and investment of money and include banks, mortgage and loan companies, and brokerage houses.

Top IT job: Programming

Top IT skills: C++, Java, customer relationship management, stock trading applications and enterprise application integration

Salaries: Amounts are down from the highs of last year. For example, a programmer with two to five years' experience could expect to earn $60,000 to $80,000 per year, depending on the job's geographic location. Project managers might earn $100,000 to $120,000.

Culture: Forget about seeing companies cater to IT job candidates' whims. As the employment market has tightened, companies have seen more candidates for open posts and have become less generous with perks.

Recruiter's view: Companies are pushing application areas that can provide additional income, and they want employees who will push, too. Poorly performing employees are likely to be shown the door. There are many openings, but companies are now hiring directly, without using staffing firms.

Resources:
Association for Financial Technology: *www.bannister.com/aft/index.html*
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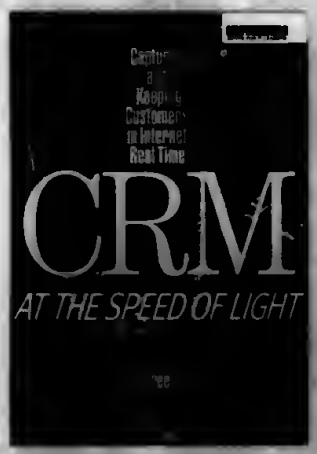

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FEATURED KEYNOTE

JEFF TAYLOR
CEO, MONSTER.COM
& CEO, TMP INTERACTIVE

Since the launch of The Monster Board in 1994, the 454th commercial site on the Web, Jeff Taylor has been recognized as an innovator and a visionary in both the Internet and careers industries. As the CEO of Monster.com, Taylor has reinvented the way in which the world looks for employment. Through Taylor's guidance and leadership, Monster.com catapulted to the number one position in the online careers industry.

As CEO of TMP Interactive, Taylor is responsible for the growth and direction of all TMP Worldwide properties and developments relating to the Internet.

SESSION HIGHLIGHTS INCLUDE

Successful College Recruiting in the Toughest Market Ever
JULIE CUNNINGHAM
TELLABS, INC.

The demand for new IT grads is at its highest level ever, while the number of grads is the lowest it has been in 10 years. How do you compete in this tough market? This session will focus on building a world-class college recruitment program: the essential elements of a program, selecting schools that are right for you, running high-yield intern programs, closing the deal with new grads, and building in evaluation metrics. Learn how to build a college recruitment program or get better results from your current efforts.

Workshop: Becoming a Strategic Business Partner With Your Hiring Managers
KEN GAFFEY
STAFFING CONSULTANT

The goal of this workshop is to:
- Identify the misconceptions that have allowed business partners to permit the Staffing role to be minimized by partners
- Discuss the Hiring Manager's concerns and issues to better identify how to insert the Hiring Managers as part of the solution matrix, and not as outsiders taking away critical production time
- To cease being the unwelcome outsiders and sometimes tolerated "outsiders"
- How to better serve Strategic Business Partners by focusing on their real needs and not on the perceived needs of Hiring Managers
- Becoming the "Project Manager for Staffing" for "Business Partners," a more rewarding and critical career than "Resume Router"

Technology 2001
SUSAN HODGES
SEMICO ENTERPRISES, INC.

There is always something new going on in IT, but the new millennium seems even busier than usual. The Internet is affecting everything that's being done and new products and skills appear daily. This session will look at the new technology in each critical area: platforms, development, data, communications, and applications.

Update on Immigration Laws Affecting Your Professional IT Staff
HARRY JOE, ESQUIRE
JENKENS & GILCHRIST

Update on the new immigration provisions for H-1B and Permanent Residence processing and their impact on recruiting and retention, and the new labor certification procedure proposed by USDOL.

Xtreme Recruiting: How We Got Here and Where We Go from Here
MICHAEL MCNEAL
PURECARBON

Michael McNeal, Chief Industry Evangelist of PureCarbon Inc., will discuss innovative approaches to HR issues, recruitment philosophy, hiring models, basic retention, and the Internet revolution. McNeal will help HR managers in a variety of fields, including B2B partners, government, universities, and companies of all sizes, to effectively increase employee retention. He will share his proven staffing strategies from Cisco Systems that will allow managers and trainers to stay competitive in a global market. McNeal will challenge conference attendees to look at the employment process differently as a method to increase retention at their organizations.

Best Practices of Retention
CATHY PETERSON
ANALYSTS INTERNATIONAL

Retention of key employees is on every CEO's agenda today, yet no one company has the prevailing solution to this enormous challenge. This highly interactive session will present best practices from different companies around the country. An open forum will follow, in which participants can share their own practices and discuss alternatives for retaining top talent.

Retention: Who's Responsible & How to Improve It
KEVIN WHEELER
GLOBAL LEARNING RESOURCES, INC.

Everyone points fingers when it comes to keeping good people. Some say it's the responsibility of the manager, others say it's all about good selection, and others say those aren't as important as salaries and benefits. Who's right? Through some mini-case studies, we will look at several organizations' efforts to control turnover. This seminar will discuss the research around retention and provide a framework for understanding it better.

Automated Screening: Guaranteed Success or Formula for Failure?
DR. WENDELL WILLIAMS
SCIENTIFICSELECTION

This highly interactive workshop will debunk bad selection science, present an easy to use performance model that will help refine selection measurement in the organization, discuss why organizations cannot trust vendors to shield them from legal liability, provide an enhanced awareness of how to separate good recruiting technology from junk science, present what can and cannot be measured using Web-based technology, provide a list of essential questions to evaluate both potential and current vendors, and gain an understanding of how you can really use the Web effectively in selection.

Panel Discussion: Diversity - What You Need to Do to Tap "All" the Top Talent
PRESTON EDWARDS (MODERATOR)
IMDIVERSITY.COM

Top employers benchmark how diversity has become a core value to attracting and retaining top talent and keeping a competitive edge.

Panel Discussion: What You Really Need to Know About Resume Management Systems or, How to Tell "Real Ware" from "Vaporware"
MARK MEHLER (MODERATOR)
MMC GROUP

SHANIL KADERALI
CISCO SYSTEMS

KATHLEEN BROWN
SKILLS MATCH CENTER

The world's most competitive corporations discuss the pros and cons of choosing and using emerging technology tools and systems.

Town Hall Forum: Pundits, Puns and Pulled Punches
MARK JESKE (MODERATOR)
COLLEGIS

GERRY CRISPIN
CAREERXROADS

KEVIN WHEELER
GLOBAL LEARNING RESOURCES, INC.

PETER WEDDLE
WEDDLE'S

Three internet recruiting pundits square off in a "no-holds barred" debate on the future of employment. Who are the winners and losers in the employment space?

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Kathrine Roberts, Mainframe Programmer, West Corporation

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IT H[illegible]s: UNIX

The universal language of UNIX continues to create opportunities for new technologies, new forms of communication – and new careers.

Bill Washington, president of **Open Systems Technology Institute (OS Tech)**, says his company hires individuals for several different aspects of the UNIX market. "We're a computer training company, and from that grew into staffing. So we train UNIX and need instructors. We also need supply system administrators and programmers for our clients, most of whom are Fortune 500 companies. What our clients need and want are people who can take UNIX and configure the server for installation, who can configure the network, install on PCs and integrate other capabilities. This is beyond certification, and that's what we provide through our training and through our staffing."

OS Tech hires full-time employees and contractual employees to place with customers. "Our customers tend toward six-month to two-year contracts and most have a stipulation for the right to hire. However, you may be assigned to a customer for a specific project, rotate back here to train or to take additional courses yourself, and then move back out to a client again."

Washington says **OS Tech** looks for strong communication and technical skills, plus experience. "We maintain a bank of resumes and then screen candidates against what our customers need to make sure they can handle the job, that they have the expertise and that they have the interpersonal skills to fit within that given environment.

"Our value to our customers, however, began with training, and that's what we can offer employees," Washington says. "We just had someone with AS400 skills return to our bench from an assignment. She knows Cisco is hot and is going to our Cisco academy, which will open still more opportunities for her."

careers

For more job opportunities with firms using UNIX, turn to the pages of ITcareers.

- **If you'd like to take part in an upcoming ITcareers feature, contact Janis Crowley, 650.312.0607 or janis_crowley@itcareers.net.**
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Technical Consultant sought by company specializing in business software solutions in Denver, CO to work in Denver & other unanticipated job sites in the US. Under close supervision, engage in moderately complex tasks regarding the support of company software applications. Specifically: provide technical support & assistance to clients throughout the United States on a broad range of issues with respect to sophisticated software applications in such areas as installation/set-up, systems administration, product configuration & functionality. Design, develop & implement modifications & enhancements. Document recurring problems or issues & recommend new directions & features to applications development team. Work is closely monitored. Engage in application development as required. Requires Bachelor's in comp. sci., electrical eng, tech. or related field; working knowledge of software installation & troubleshooting. 8am-5pm, M-F $51,600/yr (2 opgs.) Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II #400, 1515 Arapahoe Denver, CO 80202, & refer to Job Order Number JL1118761.

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Retail Software Engineer - Design, develop, test and implement the POS Designer software application for use in retail store areas utilizing knowledge of RSP C C++ Visual C++ MFC and ActiveX in UNIX and Windows environments. Develop shell scripts for application interface for automation of retail store procedures. Develop customer modifications based on special requests. Recommend design and develop migration plans for clients using the company's product installed on a Unix platform who wish to move to the Windows-based application considering all exisiting retail procedures. M-F 40 hrs. over time varies. 8:30 - 5:00. $69,500/yr. Requirements - Bachelor Degree or foreign equivalent in Computer Science or Systems Engineering and six months experience in the position offered or in the related occupation of Retail Computer Product Support. Must have proof of legal authority to work in the U.S. Send resume to: Colorado Department of Labor and Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to order number JL1118724.

Programmer Analyst-Development of software applications and use IBM PCs, UNIX C and Visual Basic. Reqs. Bachelor in Comp Science, Systems Analysis, Comp Info Systems, Comp Engg, Electrical Engg, Electronic Engg, Physics or Math or its equiv in ed and exp and 2 yrs exp in the job offered. Will accept 3 yrs college ed plus 3 yrs exp in the job offered in lieu of the required ed and exp. Will also accept any equally suitable combination of ed, training and/or exp which would qualify an applicant to perform the duties of the job offered. $61,921.60/yr, 40 hrs/wk, 8a-5p. M-F. Applicants must show proof of legal authority to work in the U.S. Send resume to Illinois Department of Employment Security, 401 South State Street - 7 North, Chicago, IL 60605. Attention: Brenda Kelly. Ref #V-IL 23904-K. AN EMPLOYER PAID AD. NO CALLS-SEND 2 COPIES OF BOTH RESUME AND COVER LETTER.

Database Adm wanted by West Bend, WI pharmaceutical mfr. Assist in development and maintenance of database syst, develop, tng, programs and materials for database users, investigate and resolve all syst prob related to database access, performance and security, supervises the installation of new software and hdwe syst relating to the database and data whs. syst. Req. BS in Compt Sci. or Engg. or equiv., & 2 yrs. exp as Oracle database adm. Respond to S. Braun, HR Dept. @ F. Dohmen Co., W194 N11361 McCormick Dr., Germantown, WI 53022.

Programmer Analysts and Sr P/As. Design, develop, code, test, and implement software solutions for databases, applications, and systems using COBOL, MVS, JCL, CICS, or Basic and one or more commercial databases. Bachelor degree in C.S., Eng'g, or Bus. related field. Multiple openings. Sr P/A req's 4 yrs exp. in the job offered or in a computer prog. position. Competitive salary, day shift, full-time. Resumes to Eric D. Reicin, Sallie Mae Inc., File 1915, 11600 Sallie Mae Drive, Reston, VA 20193.

Software Engineer sought by company that provides consulting services to state & local governments in Reston, VA to work in Denver, CO & other locations in CO. Analyze design & develop Oracle business applications in a mainframe & web-based Oracle application environment. Determine user requirements to ensure that the software that is developed meets clients objectives & specifications. Use Oracle Forms & Oracle Reports, Oracle 7.3 SQL*Plus, PL/SQL, PVCS Version Manager (Polyron Version Control System) & UNIX Shell Scripting in the development of software for the client to be used in accounts payable, general ledger, accounts receivable & purchasing. Evaluate & test vendor-supplied software packages for mainframe computers &/or microcomputers to judge compatibility with existing systems. Participate in applications development, LAN support, help desk development & database administration. Assist in the implementation of Oracle government financials applications. Requires Master's or foreign equivalent in comp sci or bus. admin + 1 yr exp using Oracle Forms & Reports, Oracle 7.3, SQL*Plus, PL/SQL & UNIX Shell Scripting. Working knowledge of PVCS version manager software. 8am-5pm, M-F, $66,100/yr. Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver, CO 80202 & refer to Job Order Number JL1118720.

Sr Software Engineer sought by financial services company in Englewood, CO to work in NJ and other unanticipated job sites in the US. At a senior level, engage in full life-cycle software development. Specifically, design and develop real time and web-based software applications on Tandem under Guardian and UNIX environment. Conduct TCP/IP and Socket programming. Analyze requirements. Create designs and design documentation. Code, test and debug software applications. Use Java, XML, TAL, C++ and TACL programming languages, J Builder, and non-stop SQL development tool in the design and development process. Requires Master's or equivalent. Specifically, it requires a Master's degree or foreign degree equivalent, plus three yrs. of progressively more responsible software development experience, or a Bachelor's degree or foreign degree equivalent, plus 5 yrs. of progressively more responsible software development experience. Working knowledge of TCP/IP and Socket programming on Tandem systems. $66,100/yr, M-F, 8am-5pm. Respond by resume to James Shimada, CO Dept. of Labor & Employment, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202 and refer to Job Order No. JL1118517.

Yield Dynamics, Inc. is looking for Software Engineer for its office in Santa Clara, CA. Position requires MS or foreign equiv in CS, Eng or related field & 2 yr exp researching, dsgng & dvlpg comp s/ware. Skills sought include: C++ and SQL.

Respond to: HR Dept, Yield Dynamics, Inc., 986 Walsh Ave., Santa Clara, CA 95050. For More job opportunities see www.ydyn.com

Information System Specialist - Manufacturer of telecommunication products seeks Information System Specialist to be responsible for design and engineering duties of information technology systems. Individual will oversee the information systems, perform highly complex work in maintaining Unix software and hardware, including repairing hardware, like hp 9000 800 and 700 series machines and in HP Unix Operating Systems; ensure the reliability of system and maintain availability of applications and servers through proactive monitoring and maintenance of capacity plans; have direct contact with personnel who use the systems extensively, resolve problems related to systems performance; recommend modifications where necessary and work with significant independence. Individual will also interact with outside hardware vendors to review items needed by company for its information technology systems; have significant responsibility for maintaining and monitoring issues such as security and data backups; keep abreast of current trends in the industry and implement sophisticated electronics and communications engineering technology. Annual compensation of $40,000 for full-time employment of 40 hours per week. Interested candidates with BA degree in Management Information Systems and who have one year experience in the position or as a Programmer Analyst should apply to Job Service 500W Trade Street, Charlotte, NC 28202. All resumes must include candidates Social Security Number and Job Order No NC 2634223 and DOT Code 033.162-018.

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Consultant. Design, develop, implement & test software for management information systems using client/server & mainframe technology Tools: SAS BASE, TSO, JCL, Access 97, Visual Basic & O. MS in Comp Sci or Mgmt Info Systems* + 3 mos exp in job offered or as Programmer or Data Analyst req'd. (*MBA with 12 hours coursework in MIS also acceptable) Previous exp must include SAS, 40 hrs/wk, 8am-5pm, $78,803/yr. Applicants must show proof of legal authority to work in the U.S. Send 2 copies of resume & cover letter to Illinois Dept. of Employment Security, 401 S. State St.-7 North, Chicago, IL 60605. Attn: Joanne Breaux. Refer V-IL 25792-N. Employer Paid Ad. No calls.

Senior Software Engineer Design, develop, implement & test 2-dimensional & 3-dimensional computer graphics & animation tools on multiple platforms for American & Asian markets. Object-oriented programming in a bilingual environment. Tools: C/C++. Open GL. MS in Comp Sci or Comp. Eng. + 1 yr exp in job offered or as Software Engineer req'd. Prior exp must include design of computer graphics including 3-D modeling in C++ and GL or Open GL. 40 hrs/wk, 9am-5pm. $62,130/yr. Applicants must show proof of legal authority to work in the U.S. Send 2 copies of resume & cover letter to Illinois Dept. of Employment Security, 401 S. State St.-7 North, Chicago, IL 60605. Attn: Joanne Breaux. Refer V-IL 25620-N. Employer Paid Ad. No calls.

Software Engineer Design, develop, implement & test software applications for script language interpretation & automatic script source code generation. Object-oriented programming. Compiler design. Tools: Multi-media authoring tools. Transframe Script V MS in Comp. Sci. or Software/Comp. Eng. req'd. Graduate education must include 1 project each with compiler design language development for object-oriented programming. & Transframe. 40 hrs/wk, 9am-5pm. $50,000/yr. Applicants must show proof of legal authority to work in the U.S. Send 2 copies of resume & cover letter to Illinois Dept. of Employment Security, 401 S. State St.-7 North, Chicago, IL 60605. Attn: Joanne Breaux. Refer V-IL 25622-N. Employer Paid Ad. No calls.

Consultant. Design, develop, implement & test software applications for management information systems using object-oriented & client/server technology. Tools: C/C++, UNIX, Visual Basic, Oracle. Bachelor's degree* in Comp. Sci., Math, Physics or Electrical Eng. + 2 yrs exp in job offered or as Software Engr. req'd. (*4 yrs exp in software development acceptable in lieu of degree) Previous exp must include C/C++, UNIX, Oracle. 40 hrs/wk, 9am-5pm, $85,000/yr. Applicants must show proof of legal authority to work in the U.S. Send 2 copies of resume & cover letter to Illinois Dept. of Employment Security, 401 S. State St.-7 North, Chicago, IL 60605. Attn: Brenda Kelly. Refer V-IL 25235-K. Employer Paid Ad. No calls.

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ASSOCIATE SOFTWARE ENGINEER to design, develop, code, test, support and maintain web based software applications using Java, XML and HTML on Windows NT and UNIX platforms. Engage in server side programming using PHP, MYSQL and Apache web servers on Windows NT and UNIX platforms. Administer and create internal databases using SQL. Require Bachelor's degree in Computer Science/Systems, Electrical Engineering, or a closely related field. Must have a demonstrated ability to perform the stated duties gained through previous work experience or academic coursework and projects. Salary $49,300 per year 8am or 9pm, M-F. Send resume to Corporate HR, EarthLink, Inc., Attn: Laurie Gardner, 1375 Peachtree Street, Level A, Atlanta, GA 30309 (No Phone Calls Please!)

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Plan, estimate, recruit, schedule and oversee the delivery of software professional services and projects. Work closely with resource managers and field personnel to determine their requirements. Ensure quality of service provided to the customer. Organize project staffing to deliver the appropriate levels of software professionals with requisite skills for the design, development and implementation of client-server and legacy systems on time and within budget. Establish relations and negotiate agreements with vendors. Conduct market research and make proposals for development of market penetration strategies. Bachelor's Degree (or equivalent) in Business, Commerce, Personnel-Labor Management or Economics and 1 yr. experience in job offered are required. Must have appropriate combination of skills as follows: A) Working knowledge of mainframe and client-server technologies and tools. B) Experience in project and resource planning and estimation. C) Working knowledge of market demand, requirements and availability of computer professionals. 40 hrs/week, 8 am - 5 pm. $54,000 - $75,000 per year. Qualified applicants should contact to send resume to Mr. Joseph Stratico, Director, Pittsburgh/Alleghany County CareerLink, 425 Sixth Avenue, Suite 2200, Pittsburgh, PA 15219. Refer to Job Order # WEB 169855.

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Systems Administrator - (Alpharetta, GA) Perform UNIX system administration in Sun Solaris and HP-UX. Specific duties and responsibilities perform backup & recovery procedures; design and implement disk mirroring & striping; responsible for upgrading SUN hardware & operating system installation & upgrading; work w/TCP/IP & sendmail configurations. BS in Computer Science/engineering plus 2 yrs exp in job offered. $60K/yr. 40 hrs/wk. Send 2 resumes to North Metro Job Order #GA 6968252. 2943 N. Druid Hills Rd. Atlanta, GA 30329 or the nearest Dept. of Labor Field Service Office.

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Contact the Corporate Headquarters for positions available in the following areas: Atlanta, Chicago, Connecticut, Denver, Florida, Massachusetts, New Jersey, New York, North Carolina, Pennsylvania, Phoenix, Southern California, Texas, Virginia/DC.

For consideration please reference Job Code: RIRCW03 and send your resume to: RCG Information Technology; Attn: National Recruiting, 379 Thornall Street, Edison, NJ 08837; FAX: (732)744-3583 or email to: recruit@rcgit.com. We are an Equal Opportunity Employer. M/F/D/V.

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Send resume to: 1100 Nasa Road One, # 502, Houston, TX 77058. Fax: 281-333-9677. email: smart@teksoft.net

HOLOGIX, INC. developer of Atricom software solutions, is seeking a Program Manager in Phoenix, Arizona. Bachelor degree in Computer Info Systems or Computer Eng or equivalent required, plus knowledge of SAP implementation projects, SAP R/3 software and SAP configuration management. Send resume to Human Resources, Hologix, Inc. 4250 E. Camelback Road, Suite K220, Phoenix, AZ 85018.

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ADVERTISERS INDEX

American Power Conversion www.apcc.com 888-289-APCC	17
Asera www.asera.com	32-33*
AT&T Business Services www.att.com	41*
Computer Associates www.ca.com	2-3
CRM at the Speed of Light www.osborne.com	63
CTO Forum http://ctoforum.infoworld.com	71
Fujitsu Amdahl www.fujitsu.com	53
Genuity www.genuity.com	13
Hewlett-Packard www.hp.com	25
IBM E-Servers www.ibm.com	9
IBM Lotus www.lotus.com/visitwireless	57
IBM Software www.ibm.com	55
Intel www.intel.com	11
InterSystems Corp. www.intersystems.com	50
ITcareers www.itcareersrecruiting.com/conf/ctrvc	64
Microsoft Biztalk Server 2000 www.microsoft.com/biztalk	20-21
Microsoft SQL Server 2000 www.microsoft.com/sql	42-43
Microstrategy www.microstrategy.com	15
Open Text Corp. www.livelink.com/computerworldus	19
Princeton Softech www.storesmarter.com	23
Red Hat www.redhat.com	34
Resource Centers www.computerworld.com/resource_centers	37
SAS www.sas.com	C3
Siemens www.sbs-usa.siemens.com/mobilebiz.htm	C4
Syncsort www.syncsort.com	4
TECHXNY www.techxny.com	61
Windows 2000 Advantage www.Windows2000Advantage.com	28-29

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ABERDEEN GROUP INC 7
ABN AMRO BANK NV 82
ACCEL PARTNERS 59
AEA 1
AIRNE SYSTEMS INC 18
ALBERTA DEPARTMENT OF ENERGY 56
ALL SCRIPTS HEALTHCARE SOLUTIONS INC 10
AMAZON COM INC 82
AMERICAN BANKERS ASSOCIATION 28
AMERICAN HOME PRODUCTS CORP 82
AMERICAN INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS 7
AMERICAN LIBRARY ASSOCIATION 1
AMERICANS FOR FAIR ELECTRONIC COMMERCE TRANSACTIONS 1
AMR RESEARCH INC 58
ANDERSEN & KURTH LLP 59
APPLE COMPUTER INC 10
ARBED GROUP 8
ARIBA INC 44
ARMED FORCES COMMUNICATIONS AND ELECTRONICS ASSOCIATION 14
ASP INDUSTRY CONSORTIUM 8
ASSOCIATION FOR FINANCIAL TECHNOLOGY 82
AT&T CORP 82
AT&T WIRELESS SERVICES INC 24
ATLANTICROOT NETWORK INC 18
AUTODESK INC 59
AVALL INC 18
BANISTER INTERNATIONAL 59
BANK OF AMERICA CORP 14
BB MARIAN MINISTRY FOR FOOD, AGRICULTURE AND FORESTRY 59
BEA SYSTEMS INC 82
BERL AND SOFTWARE CORP 82
BRADY CORP 38
BRECK TECHNOLOGY SERVICES INC 82
BRITISH TELECOMMUNICATIONS PLC 82 59
BROADVISION INC 8
BUREAU OF DIPLOMATIC SECURITY 59
BUZZSAW COM INC 59
CABLE & WIRELESS PLC 82
CABLETRON SYSTEMS INC 39
CAL TRONICS COMMUNICATIONS LTD 82
CANADIAN PACIFIC RAIL WAY 82
CANTOR FITZGERALD LP 38
CARGILL STEEL 6
CARTSENS PUBLICATIONS INC 12
CATERPILLAR INC 1
CAUCUS, THE ASSOCIATION OF HIGH TECH ACQUISITION PROFESSIONALS 59
CAZENOVE PRIVATE EQUITY 56
CHEMATION COM 7
CISCO SYSTEMS INC 6 12 24
CITIGROUP INC 73
COMPAQ COMPUTER CORP 39 56
COMPUTER ASSOCIATES INTERNATIONAL INC 8
COMPUTING RESEARCH ASSOCIATION 56
COOK COUNTY HOSPITAL 10
COVENANT LLC 7
CRANE CANADA INC 7
CRANESUPPLY COM 7
CUTTER CONSORTIUM 56
DELL COMPUTER CORP 82
DELTA AIR LINES INC 7
DENTAL DEFENSE INC 1
DENTAL ISLAND INC 7 82
DONALDSON LUFKIN AND JENRETTE 60
DOW CORNING CORP 59
DRKOOP COM INC 56
DU PONT CO 39
DUFERCO SA 8
DURLACHER CORP 56
EASTMAN KODAK CO 59
EAZEL INC 64
EBAY COM 56
ELEPHANTS ONLINE SECURITIES LLC 1
ENTERASYS NETWORKS INC 12 35 64
ENTERPRISE APPLICATIONS CONSULTING 1
ESPEED INC 38
E-STEEL LLC 6
EXODUS COMMUNICATIONS INC 7
EXTENDED SYSTEMS INC 12
EXXON MOBIL CORP 46
FBI 22
FEDERAL RESERVE BOARD 14
FEDERAL TRADE COMMISSION 46
FEDEX CORP 6
FEDEX CUSTOM CRITICAL INC 6
FILEMAKER INC 10
FINANCIAL SERVICES TECHNOLOGY CONSORTIUM 56
FINTRACK SYSTEMS CORP 73
FLORIDA INTERNATIONAL UNIVERSITY 13
FOODTRADER COM INC 38
FORRESTER RESEARCH INC 6 24
FORT JAMES CORP 38
FRONDESIGN INC 18
FUELQUEST INC 56
GARTNER INC 30 56
GATEKEEPER LLC 14
GIGA INFORMATION GROUP INC 1 64
GLENAYRE ELECTRONICS INC 8
GLOBAL STEEL EXCHANGE 6
GLOBALNETEXCHANGE LLC 7
GREENWICH NATWEST 1
CAPITAL MARKETS 4, 82 56
HARVARD BUSINESS SCHOOL 56
HEALTHEAGLE INFORMATION AND MANAGEMENT SYSTEMS SOCIETY 10
HEALTHCID COM INC 10
HEWLETT-PACKARD CO 14 18
HONEYWELL INTERNATIONAL INC 6
HURWITZ GROUP INC 82
HYPERION SOLUTIONS CORP 24
I2 TECHNOLOGIES INC 18
IBM 6 10 56 82
IDC 10 12 24 27 56
IDRITE 56
INCHCAPE SHIPPING SERVICES INC 7
INFORMATION BUILDERS INC 10
INTEL CORP 13 60
INTERBIZ 8
INTERNATIONAL COMPUTER NEGOTIATIONS INC 49
INTERNET CORPORATION FOR ASSIGNED NAMES AND NUMBERS 16
INTERNET SECURITY SYSTEMS INC 64
INVENSYS PLC 44
INVENSYS SOFTWARE SYSTEMS 44
ITEMUS INC 27, 29
IXOS SOFTWARE AG 82
JACKSON NATIONAL LIFE INSURANCE CO 82
JETBLUE AIRWAYS CORP 56
JOHN F. KENNEDY INTERNATIONAL AIRPORT 56
JOHNS HOPKINS SCHOOL OF PUBLIC HEALTH 12
KIMBERLY-CLARK CORP 46
KRAFT FOODS INTERNATIONAL INC 56
KVS PLC 60
LAWSON SOFTWARE 18
LEVEL 3 COMMUNICATIONS INC 7
LIGHTFLOW COM INC 56
LOEWS CINEPLEX ENTERTAINMENT CORP 40
MANUGISTICS GROUP INC 7
MANX TELECOM 82
MERRILL LYNCH & CO 62 73
METALSPECTRUM 8
METROPOLITAN LIFE INSURANCE CO 82
MICHIGAN DEPARTMENT OF CIVIL SERVICE 18
MICROSOFT CORP 6,7 10 14 18 22 62 64 66 74
NABISCO INC 38
NASA 12
NATIONAL CENTER FOR EDUCATION STATISTICS 56
NATIONAL CONFERENCE OF COMMISSIONERS ON UNIFORM STATE LAWS 1
NATIONAL MARROW DONOR PROGRAM 56
NEC CORP 24
NEOR GAS 62
NORFOLK SOUTHERN CORP 62
NORTEL NETWORKS CORP 24
NORTHPOINT COMMUNICATIONS 56
NORTHROP GRUMMAN CORP 44
NORTHWESTERN UNIVERSITY 56
NOVELL INC 56
NTT DOCOMO INC 64
OFFICE OF INTERNATIONAL INFORMATION PROGRAMS 56
OMICRON-CHICAGO 7
OPEN SYSTEMS ADVISOR INC 56
ORACLE CORP 8 2 60
OTG SOFTWARE INC 60
PACIFICARE HEALTH SYSTEMS INC 39
PAINE WEBBER GROUP INC 39
PALM INC 12,27
PATIENTKEEPER INC 10
PENNSYLVANIA STATE UNIVERSITY 8
PEOPLESOFT INC 1 46
PEPSI-LATIN AMERICA 56
PETPLACE COM INC 39
PHDS CORP 56
PRE INC 44
PRICEWATERHOUSECOOPERS 62
PROGRESSIVE CASUALTY INSURANCE CO 39
PROMIM INC 18
PRUDENTIAL FINANCIAL 62
PSINET INC 62
PURDUE UNIVERSITY 56
R R DONNELLEY & SONS CO 8
RAPP INC 6
RATIONAL SOFTWARE CORP 62
REDPOINT VENTURES 62
REMEDY CORP 7
RESEARCH IN MOTION LTD 6
ROYAL CARIBBEAN CRUISES LTD 56
ROYAL DUTCH/SHELL GROUP 56
RSA SECURITY INC 56
RUSSELL REYNOLDS ASSOCIATES INC 62
SAMSUNG CORP 6
SANS INSTITUTE 1 64
SAP AG 10 18
SHELL SERVICES INTERNATIONAL INC 56
SHOMITI SYSTEMS INC 54
SMART CHIP TECHNOLOGIES INC 39
SOCIAL SECURITY ADMINISTRATION 10
SOCIETY OF INFORMATION DISPLAY 62
SONY CORP 10
SONY ELECTRONICS INC 10
SOUTHWEST MISSOURI STATE UNIVERSITY 56
SPHERION CORP 62
SPRINT COMMUNICATIONS 64
SPRINT CORP 24
SPRINT PCS GROUP 24
SPYRUS INC 62
STANFORD UNIVERSITY LAW SCHOOL 1
STARBUCKS CORP 27,30
STATE STREET CORP 44
SUN MICROSYSTEMS INC 6,8 10 36 62 64
SYMANTEC CORP 14
TACTICAL STRATEGY GROUP INC 62
TANDE NETWORKS INC 24
TELE.COM APPLICATION SERVICES LTD 12
THE BANKING CHANNEL 62
THE BELDEN BRICK CO 6
THE BUSINESS COUNCIL 59
THE CHASE MANHATTAN BANK 56
THE DELPHI GROUP 8
THE GOLDMAN SACHS GROUP INC 59
THE HOME DEPOT INC 44
THE INSIGHT RESEARCH CORP 49
THE INSTITUTE OF INTERNAL AUDITORS INC 14
THE PRINCIPAL FINANCIAL GROUP 1
THE WACKENHUT CORP 59
THE YANKEE GROUP 62
TIVOLI SYSTEMS INC 6
TOP LEVEL DOMAIN ASSOCIATION INC 16
TOWERGROUP 73
TRADEARBED 6
U.S. AIR FORCE 1
U.S. DEPARTMENT OF COMMERCE 14 16
U.S. DEPARTMENT OF STATE 22
UBS 56 39
UNIVERSITY OF ALABAMA 56
UNIVERSITY OF PENNSYLVANIA 56
UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES 12
UNIVERSITY OF TORONTO 36
UNIVERSITY OF VIRGINIA HEALTH SYSTEM 10
VERITAS SOFTWARE CORP 60
VERIZON COMMUNICATIONS 24
VIATHAN CORP 62
VIEWETTE CORP 8
VIRGINIA TECH COMPUTING CENTER 1
VOLKSWAGEN OF AMERICA INC 39
WEBMETHODS.COM INC 56
WELLS FARGO RETAIL FINANCE LLC 62
WHARTON SCHOOL 62
WORLD INTELLECTUAL PROPERTY ORGANIZATION 6
WORLDSTREET CORP 62
X-CAVATE RESEARCH LLP 62
ZANY BRAINY INC 34
ZONA RESEARCH INC 6
ZURICH NORTH AMERICA FINANCIAL ENTERPRISES 1

Financial Services Giants Look to Seed IT Start-ups

Partnerships help companies boost their online business offerings to customers

BY LUCAS MEARIAN

FINANCIAL services companies such as New York-based Merrill Lynch & Co. are embracing strategic partnerships with technology and service providers as a means of expanding their online offerings.

The trend, which allows for the joint creation of applications, enables brokerages to offer new services to customers and then resell those same services to competitors. That can spur adoption of the technology and provide a return on brokerages' investments.

According to Needham, Mass.-based market research firm TowerGroup, partnerships are becoming attractive to financial services firms because rapidly changing technology and a shortage of IT workers have made in-house development more difficult.

Such marketplace pressures are creating a split in the financial services industry, said Mark Sievewright, president and CEO of TowerGroup. Some firms, such as New York-based Citigroup Inc., are trying to be full-service providers. Others, like Merrill Lynch, want to be partnership-oriented firms.

PACKER: Merrill Lynch is partnering with ASP FinTrack.

In the past two years, Merrill Lynch has added more than 70 "significant" applications to its Web site, said Michael Packer, the company's head of institutional e-commerce. And 45 of those applications were added in the past year alone.

In October, for example, Merrill Lynch entered a partnership with New York-based application service provider FinTrack Systems Corp. to develop a Web-based equity trading system for clients.

Since Merrill's site connects to dozens of back-end systems, it must deliver information in real time over the Internet and have security and controls to handle the transactions at the same time, Packer said.

"It was clear to us if we used just Merrill Lynch employees and licensed products, or even went to vendors and said, 'Build this model for us,' it wouldn't sustain us or get there fast enough," Packer said. Merrill Lynch also loaned FinTrack a senior business employee for one year to help the start-up grow. With Merrill Lynch holding a minority stake in FinTrack, there was "incentive for both of us to work hard together," Packer said. The move led to the creation of eCharm, which Merrill Lynch now helps FinTrack sell to financial services competitors.

Continued from page 1

IT Security

gets for lawsuits, agreed Margaret Jane Radin, a professor of law, science and technology at Stanford University Law School.

Legal liability in such cases is likely to depend on what prevention technologies and practices are available and on whether these technologies and practices are reasonably cost-effective to implement, she said.

As a result, showing due diligence will mean everything from implementing technologies such as firewalls, intrusion-detection tools, content filters, traffic analyzers and virtual private networks to having best practices for continuous risk assessment and vulnerability testing. It will also mean having corporate policies and procedures backing up all of this, analysts said.

"There are a lot of dimensions to the issue," most of which are outside the purview of IT departments, said David Krauthamer, MIS manager at Advanced Fibre Communications Inc., a manufacturer of telecommunications equipment in Petaluma, Calif. What IT managers need to do is to "be very aggressive about controlling and monitoring security," Krauthamer added.

The issue of who bears responsibility for DDOS attacks, for instance, is a question that is likely to be legally tested in the very near future, agreed most analysts.

DDOS attacks use a multitude of hacked systems, known as slaves or zombies, to inundate a Web site or Internet-connected server with a flood of useless traffic.

"The legal aspects [of such attacks] are a big, wide-open issue," said Tony Gauvin, a vice president of software and operations at ElephantX Online Securities LLC, a New York-based financial start-up.

The attacks are hard to pinpoint, since they involve multiple sources, including service and network providers, hosting companies, portal operators, corporate sites and universities.

It's possible that not only will service providers be held legally liable for such attacks, but victim sites — those co-opted by perpetrators to take part in the attack and sites crippled by attacks— could be as well, said Joseph A. Cooper, president of Digital Defense Inc., a San Antonio-based Web security company that specializes in financial services firms.

For instance, an online trading site taken down by a DDOS attack could be found negligent if it lacks adequate measures to assess the security readiness of its Internet service provider, Cooper said.

"From a liability standpoint, it is a good defense to be able to say that the [security technologies] you have are state of the art and adequate and that you have done everything you can," said Tom Beach, senior vice president of risk management solutions at Zurich North America Financial Enterprises, a Baltimore-based financial services company that provides insurance for third-party liability. Zurich, like the growing list of insurance companies scrambling to provide third-party liability insurance, offers security assessment services through third parties and also has recommended best practices for its clients.

Emerging privacy and security regulations, such as the Health Insurance Portability and Accountability Act and the Gramm Leach-Bliley Act governing financial institutions, mandate specific requirements for firms in these industries.

Companies outside of these industries would also do well to adopt a similar continuous cycle of identifying and eliminating risk mandated by these regulations, analysts said.

Ultimately, "the point to remember is that where there are no specific laws, they will be built in the courtroom," warned Marc Enger, a former director of security operations for a branch of the U.S. Air Force and now a director at Digital Defense.

Tort Tests

Margaret Jane Radin, professor of law, science and technology at Stanford University Law School, speculated on how courts are likely to analyze DDOS-based tort claims.

- **It's likely courts will** consider liability for DDOS attacks under the rubric of negligence rather than that of strict liability.
- **Damages could follow** if the negligence results in losses on account of a DDOS attack, if the losses are foreseeable and could have been prevented with the exercise of due care.
- **In the absence of** contractual disclaimers, a service provider and its customer are bound to show reasonable care.
- **A network intermediary** could be held liable to its customer, such as a portal or other e-commerce site, which could be held liable to its own customers.

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FRANK HAYES/FRANKLY SPEAKING

The Source of Clout

DOES IT MATTER? Does it really matter whether your CIO is one of the five best-paid executives in the company? In last week's *Computerworld* Cover Story, reporter Kim S. Nash dug through proxy statements for the Fortune 1,000 and discovered that only 46 CIOs — 4.6% — made that lofty grade.

Of course, that doesn't take into account big conglomerates where the top five has to include divisional presidents. And just because your CIO is No. 6 or 7 doesn't mean IT doesn't have a place at the table. It's just an indicator. But yeah, it matters.

Not because it means the CIO gets a bigger boat. Not because the IT shop gets bragging rights. Not because the visibility demonstrates that technology is really business-critical here or some such high-sounding gobbledygook.

It matters because those dollars measure how much clout the CIO has. That's clout to get capital equipment IT people need, to make important projects happen, to hire the right people and pay them well. It's clout to go head to head with sales and manufacturing and marketing chiefs at budget time. It's clout to help guide the business.

Not just the technology — the business. That's *why* a CIO has clout. Not professionalism. Not technical savvy. Certainly not the "business importance of IT." CIOs with clout are at the table because they understand business, they talk business and they make business happen.

And, oh yeah, because their IT departments understand business and make it happen, too. CIOs with clout have IT people who take care of business.

Not just technology. Business.

And why aren't more CIOs on the nosebleed rungs of the corporate ladder? Because too many people in their IT shops aren't comfortable with business.

OK, sure, we're technical people. We like code and wires and speeds and feeds. And for a long time we didn't really have much to do with doing business. We just processed data.

But those days ended long ago. And today we can't afford to be the only major group in the company that's *not* focused on doing business.

Look, we'd sneer at a sales guy who could make an elaborate pitch but couldn't close the sale and book the business. What good is all that jawing if he doesn't bring back money?

We'd laugh at a marketing chief who came up with clever slogans and promotional ideas but didn't put together a marketing campaign that moved the product. We'd snicker at a business development executive who dreamed up brilliant partnership opportunities but never actually got any of them to generate revenue. We'd jeer at a manufacturing operations guy who couldn't get the right products out the door at the right time.

CIOs with clout have IT people who take care of business.

FRANK HAYES, *Computerworld*'s senior news columnist, has covered IT for more than 20 years. Contact him at frank_hayes@computerworld.com.

Pretty ridiculous, huh? But why should we think we deserve any better if we're not taking care of business, too?

Supply chains, e-commerce, Web stores, even departmental applications — they're all business projects, not just technical exercises. We've got to think of them that way to understand what our users need, and why, and how to deliver it.

Otherwise we're just kidding ourselves about IT's importance to the business.

So if your CIO isn't at the table with your organization's other top execs — yes, it matters. And if IT doesn't have real clout in your company, you probably don't have to look far to find the reason. ▶

SHARK TANK

ALASKAN OIL COMPANY has a server named for a local fishing village called Homer. By coincidence, there's a database of biological activity reaction test results – BART data – on that server. But when a new manager arrives, his first demand is to change the names. "It's unprofessional," manager sniffs. "*The Simpsons* is a juvenile program."

HELPFUL USER informs help desk that the toilet in the men's room isn't working. Thanks, but why tell us? asks puzzled pilot fish. "Well, it flushes automatically," says user. "Since it's obviously computer-controlled, I thought you might want to fix it."

SECRETARY PILOT FISH gets complaint from a user who can't print out the attachment she sent him. "Every time I try to print it, I get an error saying 'printer out of paper,' and it won't print," he says. "Put more paper in your printer, then let me know if it still doesn't work," secretary suggests – and she doesn't hear from that user again.

CORPORATE HONCHO calls help desk; he's forgotten his password and wants pilot fish to give it to him. Fish explains he'll have to assign a new password – "all we can see are astersks where your password is." Replies honcho, "Well, you're the technical wizards – figure out what the little astersks mean."

IT MANAGER pilot fish tracks down what's blocking this sales guy's Web access: An Internet ad banner filter that the sales guy installed himself won't work through the proxy server. Why'd you install this? he asks as he removes it. Sales guy responds, "I really wanted it for home, but I figured I'd try it here first to see how it worked."

Try one on me, **sharky@computerworld.com.** You get a stylish Shark shirt if your true tale of IT life sees print – or if it shows up in the daily feed at *computerworld.com/sharky.*

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